

AVIATION WEEK

SEPT. 3, 1951

50 CENTS

A MCGRAW-HILL PUBLICATION

A NEW **BG** SPARK PLUG

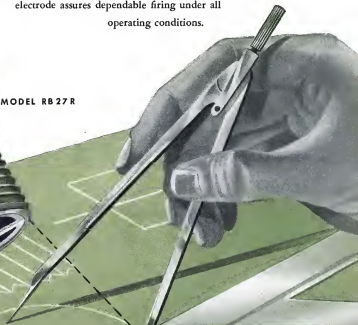
Engineered for Dependability and Maximum Performance

The superior service life of BG, the Spark Plug of Dependability, over ordinary spark plugs — has always made it the most economical in the long run.

The new Model RB 27 R reduces lead fouling to a minimum due to a ceramic nose shape designed to allow the gases to swirl and produce a scavenging action. The unique twin platinum electrode assures dependable firing under all operating conditions.



MODEL RB 27 R



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BG products, write:

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As they say in Rochester:

"Let us tell you about our operation"

At Rochester, Minn., one of the great medical capitals of the world, operations (medical variety) are naturally an interesting topic of conversation. Another kind of Rochester operation that you have talked about in the world-at-large is the ambulance service operated by Gopher Aviation, Inc. In addition to Standard Skyway Service, Gopher Aviation offers a number of other fine services. Gopher's ambulance shops have specially designed stretchers for aerial use, oxygen equipment for passengers, and services. Travelers are available as needed. In addition, Gopher officials are especially proud of their maintenance shops which handle more than 100 private aircraft from all over the Middle West. "One of the best things we have to offer our many customers," says Gopher Aviation boss, Art Hoffman, "is Standard Skyway Service. In this end of the operation, as throughout, we want the quality products, so we choose Standard."



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Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

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OFFICIALS IN AIRCRAFT, AIRCRAFT AND MARINE IGNITION SHIELDING

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"T.R."

TAKES TO THE AIR...



One of the nation's VIP's to fly was "Taddy" Roosevelt. In October 1913 Roosevelt flew with general John "Ash" Henshaw at the U. S. Coast Aero Club flying meet.

LINGO tips that Theodore Roosevelt was the first to fly the machine in itself shortly after 1900. Perhaps he followed through on the course briefly, but there is no record of the future Chief Executive so early flying a plane.

Henshaw was a member of the Wright Flying Team. Flying his 4-cylinder Wright biplane (open in front, closed in back) in 1913, Henshaw captured an altitude record at Los Angeles

in 1913. Then some time he set an American record for "timed flight" with a trip from Springfield, Illinois to Dayton, Missouri.

Henshaw explains all the jargon of flying a biplane. And paralleling this record of adventure is another record of safety, scientific research. In one phase of the research, that of weapon tests and failures, Phillips Petroleum Company has played a conspicuous part. Phillips has long been a leader in the

development of new fuels. Today, Phillips is a major producer of high grade aviation gasoline for military and commercial planes. And, already, Phillips is delivering such new fuel for turbo-prop and jet.

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FINISHED PARTS are checked right in the assembly line with play gage mounted pictured at left. Tolerances as close as 0.001 in. are maintained.

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NEWS DIGEST

DOMESTIC

Los Angeles Airways' mail helicopter crashed Aug. 27 killing Pilot Carl Carr and demolishing the \$51. Preliminary check indicates that a rotor blade flap (wing, tail, leg, gear) was jammed, preventing the blade to separate from the rotor head, while the craft was hovering 100 ft. over Lynwood-Corpus Christi airport. The crash cut LAA's down to three options, necessitating a temporary rearrangement of mail routes.

Lt. Gen. Kenneth B. Wolfe, who assumed July 1 as USAF Deputy Chief of Staff, Missouri, has been appointed president of the new Ogdish Tool & Armory Corp. of America, subsidiary of the Swiss Ogdish Machine Tool Works. Gen. Wolfe has offices in the Bureau Building, 1731 E. 86th St., Minneapolis, D. C., presiding over arrangements for other facilities of the new firm.

Shimadzu and Bell Helicopters have participated in more than 1,500 rescue and evacuation of personnel in the Korean theater.

Howard Hughes has postponed scheduled launching of his big, eight engine flying boat "because of problems concerning the powerplant (P&W J-480 Turbo-Wasp) which had run at the test aircraft." A spokesman for the firm said that the launching may be postponed about three months and has approval of RFC. The plane was last flown in November, 1947.

Chrysler Corp. will build P&W J-48 Turbo-Wasp jet engines for the Navy as a 1.6 million sq ft plant to be built in Detroit. The order is estimated at about \$600 million.

UAL pilots are free to strike at any time, now that the National Mediation Board has withdrawn from settlement efforts, says Air Line Pilots Assn. (ALPA) executive committee in aid to have proposed to give United 72 hours notice before going out.

Col. Kenneth E. Fields has been named director of the Air Force Research Command's division of military applications, succeeding Brig. Gen. James McCoskirk, Jr., assigned as a special assistant to Deputy Chief of Staff, Development, USAF.

Purchase of a 34-acre tract near this town, for erection of a guided missile plant has been approved by the Senate and House committees on armed services.

UAL DC-68 crashed near Oakland, Calif., while making an approach to the airport killing 44 passengers and crew members. It was the first DC-68 to crash. The FBI was working in the investigation.

A Convair B-56 plowed into a parked carrier ship at Travis AFB where its landing failed, causing the jet plane's wing and struts to be damaged.

Maj. Gen. James F. Phillips has been appointed commanding general of the USAF aircraft center at Cranfield, Mass.

The 51st Fighter Wing, comprising 75 NAA F-86 Sabres and 1,500 men, is the first American air unit to be based permanently in England since World War II. First squadron of the outfit has already arrived in Britain and two more are due soon. The 51st is being reorganized into Western European air defense.

FINANCE

Solar Aircraft Co. net profit for the company's first fiscal quarter ending July 31 was \$245,500 on total sales of \$10,452,500 after provision for depreciation, federal income and excess profits taxes. Earnings currently are \$78,500,000.

Northwest Airlines reports operating revenues during July totaled \$4,670,000 with earnings after provision for taxes being \$159,600. Passenger re-arranging for the month came to \$1,936,113 and mail revenues were \$609,575.

National Airlines has reported a second net profit of \$1,599,073 for the third year ended June 30, with fixed 1951 investment of \$24,054,760 up 54% over the previous fiscal year.

Lockheed Aircraft Corp. voted a dividend of 30 cents per share of the new stock resulting from a 2-to-1 stock split authorized recently, payable Sept. 14 to holders of record on Aug. 24.

Northern Aircraft, Inc., has voted a 25-cent-a-share dividend payable Sept. 14 to holders of record on Aug. 25.

INTERNATIONAL

Handley Page H.P. 85 aircraft jet plane, featuring wings that are swept back and then forward, exploded and crashed during a flight test.

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burns and anorthosis welding avail-
able in response for specific information with
history, welding joint requirements

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References

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Sept. 37—Royal Agricultural Society 188

David International Development Studies
Unit, Brighton, Sussex, England

Sept. 30-31—Sixth national instrument conference and exhibit sponsored by the Instrument Society of America, San Houston College, Houston, Tex.

Sept. 18-19—Seventh annual general meeting of the International Air Transport Ass., Westminster School, London, England. Program includes one-day visit to BA/C; Farnborough show.

Sept. 11 (L)—Yvonne Dwyer, display and exhibition of the Society of British Aircraft Constructors, Trenchard, England.

Sept. 15—Air tour to Nantuxet Island, Mass., sponsored by the Nantuxet Flying Club. Nantuxet Island and lower Mass.

Sept. 17-19-19th annual convention of the International Northwest Aviation Club

Sept. 10-20—Meeting of the meteorology committee of the Air Transport Ass.,

Gettysburg Lodge, Denver
Sept. 28-November, Western Area, Southern,
with husband and sons. West

Sept. 25-28—Fall meeting of the American Society of Mechanical Engineers, Hotel

Oct. 2-4-Seventh annual soccer sports plug

(Oct. 14—Annual national convention)

and engineering display and aircraft production forum, sponsored by Society of Automotive Engineers, Willow Hotel.

Oct. 4-10—Special conference on search-related applications sponsored by the

source apparatus, sponsored by the
transportation committee of the
American Institute of Electrical Engineers
and the American Institute of Chemical Engineers.

and the Los Angeles section of the Institute. Hollywood Roosevelt Hotel, Hollywood.

Chs. 11-12-1991 conference on airport management and operations, University of Oklahoma, Norman, Okla.

Oct. 26-27—Fourth annual New York State conference on airport development and operations sponsored by the N. Y. State

operation, sponsored by the N. Y. State Dept. of Commerce, N. Y. Aviation Trades Assn., Assn. of Towns of the State, Conference of Mayors, County Officers

Conference of Mayors, County Officers,
Amen and the N. Y. State Planning Council,
Oswego Hotel, Syracuse, N. Y.

Oct. 26-30—Air Industry & Transport
Ann. of Canada annual general meeting,
Seymour Club, Montebello, Quebec

Oct. 24-25-1951 annual convention of the National Assoc. of State Auditors Officers, Jackson, Miss., Thomas, Ark.

Oct. 13-Nov. 4—Society of Automotive Engineers, Falls and Johnsons meetings, Detroit

Nov. 7—Annual Wings Club Dinner, Waldorf Astoria, New York

1—(E. A. G.) Kaysone (FARLF); 2a—Dham (UAF); 2b—McGraw-Hill World News; 3—Chitri Kilpa Dehra; 11—FARLF; 12—11—(G. P.) Mookerjee; 13—McGraw-Hill World News.



BRITAIN'S LATEST JET BOMBER—First photo of the new Short SA-4 bomber powered by four Rolls-Royce Avons, mounted in position above the altar. Carrying a crew of five, the big new plane has a delta fuselage, and four-wheel bogie landing gear.

New Developments in Military Aviation



PHOTO BANSHEE—McDonnell F1H-2P has had its nose extended and enlarged to take on different types of cameras for photo reconnaissance or SR to 50,000 ft. altitude.



RAF'S NEW SWIFT—In quantity production for RAF fighter squadrons, the new Falk-Boyer Asymptotized Supermarine Swift shows its modular structure, everywhere while in a boat.

FRONT-FITTED SAFETY-belted or loose-restraining postures are fitted on the way trails of this NAA P46E, (below) indicating USAF is still interested in British polo-and-dodge games. Differences from the Boeing F4u; B-29; B-52; B-57; B-70; B-71; B-72; B-73; B-74; B-75; B-76; B-77; B-78; B-79; B-80; B-81; B-82; B-83; B-84; B-85; B-86; B-87; B-88; B-89; B-90; B-91; B-92; B-93; B-94; B-95; B-96; B-97; B-98; B-99; B-100; B-101; B-102; B-103; B-104; B-105; B-106; B-107; B-108; B-109; B-110; B-111; B-112; B-113; B-114; B-115; B-116; B-117; B-118; B-119; B-120; B-121; B-122; B-123; B-124; B-125; B-126; B-127; B-128; B-129; B-130; B-131; B-132; B-133; B-134; B-135; B-136; B-137; B-138; B-139; B-140; B-141; B-142; B-143; B-144; B-145; B-146; B-147; B-148; B-149; B-150; B-151; B-152; B-153; B-154; B-155; B-156; B-157; B-158; B-159; B-160; B-161; B-162; B-163; B-164; B-165; B-166; B-167; B-168; B-169; B-170; B-171; B-172; B-173; B-174; B-175; B-176; B-177; B-178; B-179; B-180; B-181; B-182; B-183; B-184; B-185; B-186; B-187; B-188; B-189; B-190; B-191; B-192; B-193; B-194; B-195; B-196; B-197; B-198; B-199; B-200; B-201; B-202; B-203; B-204; B-205; B-206; B-207; B-208; B-209; B-210; B-211; B-212; B-213; B-214; B-215; B-216; B-217; B-218; B-219; B-220; B-221; B-222; B-223; B-224; B-225; B-226; B-227; B-228; B-229; B-230; B-231; B-232; B-233; B-234; B-235; B-236; B-237; B-238; B-239; B-240; B-241; B-242; B-243; B-244; B-245; B-246; B-247; B-248; B-249; B-250; B-251; B-252; B-253; B-254; B-255; B-256; B-257; B-258; B-259; B-260; B-261; B-262; B-263; B-264; B-265; B-266; B-267; B-268; B-269; B-270; B-271; B-272; B-273; B-274; B-275; B-276; B-277; B-278; B-279; B-280; B-281; B-282; B-283; B-284; B-285; B-286; B-287; B-288; B-289; B-290; B-291; B-292; B-293; B-294; B-295; B-296; B-297; B-298; B-299; B-300; B-301; B-302; B-303; B-304; B-305; B-306; B-307; B-308; B-309; B-310; B-311; B-312; B-313; B-314; B-315; B-316; B-317; B-318; B-319; B-320; B-321; B-322; B-323; B-324; B-325; B-326; B-327; B-328; B-329; B-330; B-331; B-332; B-333; B-334; B-335; B-336; B-337; B-338; B-339; B-340; B-341; B-342; B-343; B-344; B-345; B-346; B-347; B-348; B-349; B-350; B-351; B-352; B-353; B-354; B-355; B-356; B-357; B-358; B-359; B-360; B-361; B-362; B-363; B-364; B-365; B-366; B-367; B-368; B-369; B-370; B-371; B-372; B-373; B-374; B-375; B-376; B-377; B-378; B-379; B-380; B-381; B-382; B-383; B-384; B-385; B-386; B-387; B-388; B-389; B-390; B-391; B-392; B-393; B-394; B-395; B-396; B-397; B-398; B-399; B-400; B-401; B-402; B-403; B-404; B-405; B-406; B-407; B-408; B-409; B-410; B-411; B-412; B-413; B-414; B-415; B-416; B-417; B-418; B-419; B-420; B-421; B-422; B-423; B-424; B-425; B-426; B-427; B-428; B-429; B-430; B-431; B-432; B-433; B-434; B-435; B-436; B-437; B-438; B-439; B-440; B-441; B-442; B-443; B-444; B-445; B-446; B-447; B-448; B-449; B-450; B-451; B-452; B-453; B-454; B-455; B-456; B-457; B-458; B-459; B-460; B-461; B-462; B-463; B-464; B-465; B-466; B-467; B-468; B-469; B-470; B-471; B-472; B-473; B-474; B-475; B-476; B-477; B-478; B-479; B-480; B-481; B-482; B-483; B-484; B-485; B-486; B-487; B-488; B-489; B-490; B-491; B-492; B-493; B-494; B-495; B-496; B-497; B-498; B-499; B-500; B-501; B-502; B-503; B-504; B-505; B-506; B-507; B-508; B-509; B-510; B-511; B-512; B-513; B-514; B-515; B-516; B-517; B-518; B-519; B-520; B-521; B-522; B-523; B-524; B-525; B-526; B-527; B-528; B-529; B-530; B-531; B-532; B-533; B-534; B-535; B-536; B-537; B-538; B-539; B-540; B-541; B-542; B-543; B-544; B-545; B-546; B-547; B-548; B-549; B-550; B-551; B-552; B-553; B-554; B-555; B-556; B-557; B-558; B-559; B-560; B-561; B-562; B-563; B-564; B-565; B-566; B-567; B-568; B-569; B-570; B-571; B-572; B-573; B-574; B-575; B-576; B-577; B-578; B-579; B-580; B-581; B-582; B-583; B-584; B-585; B-586; B-587; B-588; B-589; B-590; B-591; B-592; B-593; B-594; B-595; B-596; B-597; B-598; B-599; B-600; B-601; B-602; B-603; B-604; B-605; B-606; B-607; B-608; B-609; B-610; B-611; B-612; B-613; B-614; B-615; B-616; B-617; B-618; B-619; B-620; B-621; B-622; B-623; B-624; B-625; B-626; B-627; B-628; B-629; B-630; B-631; B-632; B-633; B-634; B-635; B-636; B-637; B-638; B-639; B-640; B-641; B-642; B-643; B-644; B-645; B-646; B-647; B-648; B-649; B-650; B-651; B-652; B-653; B-654; B-655; B-656; B-657; B-658; B-659; B-660; B-661; B-662; B-663; B-664; B-665; B-666; B-667; B-668; B-669; B-670; B-671; B-672; B-673; B-674; B-675; B-676; B-677; B-678; B-679; B-680; B-681; B-682; B-683; B-684; B-685; B-686; B-687; B-688; B-689; B-690; B-691; B-692; B-693; B-694; B-695; B-696; B-697; B-698; B-699; B-700; B-701; B-702; B-703; B-704; B-705; B-706; B-707; B-708; B-709; B-710; B-711; B-712; B-713; B-714; B-715; B-716; B-717; B-718; B-719; B-720; B-721; B-722; B-723; B-724; B-725; B-726; B-727; B-728; B-729; B-730; B-731; B-732; B-733; B-734; B-735; B-736; B-737; B-738; B-739; B-740; B-741; B-742; B-743; B-744; B-



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WHO'S WHERE

In the Front Office

A. A. Korman has been named vice president and western manager for Van Pelt-Holmes Industries, Los Angeles. His previous post was in computer.

Changes

W. W. (Bill) Reddick has been transferred from Seattle to Wichita plant of Boeing Airplane Co. to act as assistant factory manager on the B-47 program, and will have as his assistant J. J. (Jack) Chalk.

Robert R. Allen has been appointed assistant general manager for the Austin City of Services. Other changes in the firm include Joseph V. Tice to manufacturing manager, Francis D. Carls to production control superintendent, and Rose Adams, Henry G. Williams (JRN, Ret.), has been designated director of customer relations.

Harley C. Fugle has been placed in charge of Statistical Instruments new branch office in Dallas.

Neil Root, formerly Lockheed publicity manager, has been made public relations manager of Consolidated Vultee Aircraft. Louis R. Tulaszka, previously head of the mechanical and mechanical engineering departments, Syracuse U., has joined Wright Aeronautical Corp. as staff engineer.

Chyle W. Hall has been designated assistant manager of manufacturing for Sola Aircraft at San Diego and Raymond W. Rock has been named purchasing agent. Hall's post as manager of the firm's New York office will be held by Harry E. Eby.

James W. Sherry has been appointed deputy regional administrator of CAA's Second Regional Office at Atlanta and W. Wright Holland has been made executive assistant at the office.

Group Capt. Wilbur H. Sutton has been appointed senior staff officer, RAF Tring Post Command, with the acting rank of Air Commodore.

Wm. W. F. (Bud) Long has returned as vice control and management of Los Fidd's Dallas Area Service, Inc. R. B. Sutton has been made director.

Whitney Berke, formerly instrumental sales representative for South America, has been named manager of commercial sales covering entire North America for South American Airlines.

Laurel C. Ziemer has been designated administrative manager in Air France's general manager of the North America and Caribbean branch.

What They're Doing

Walter E. Cress has submitted his resignation to the California Aeronautics Commission, effective Nov. 1, as state director of aeronautics. He has held the position for four years. The commission is asking John A. Anderson to accept a new position to fill the post.

INDUSTRY OBSERVER

► The almost instant M45 fighter which was fitted up July 21 by now based U. S. British and ROK navy parties out of 17 ft. of water on a conflict war Nauchon after it was shot down by a USAF F-46 is going to General University aviation laboratories for engineering analysis, and possible reconstruction. It was first discovered in photographs made by British planes from the carrier Clasp. It was ordered to General after a brief examination at AMC Johnston Wright-Patterson AFB.

► Watch for a possible comeback of a new and later Navy America B-45 low jet bomber with a new wing, other much thought as except. The airplane in its present status as a photo reconnaissance craft was proved out in Korea, although the first lot of a B-45 in enemy territory was reported recently.

► A new version of the Douglas C-124 two-engine heavy transport now in development will have a new cargo door approximately 9 ft. 11 ft. ft. so that the airplane can be loaded from the rear as it is unloaded from the nose. Thus it will be designed with elevator characteristics, able to lift a 13,000-lb. load into the plane.

► Australian National Defense Commission has ordered cancellation of orders for 10 British Vulcan Phantom Phantom planes, after the Australian government refused permission to reproduce in quantity the airplane. Decision as what new equipment will replace the canceled Vulcans has not been disclosed.

► The McDonnell Douglas F3H fighter now in service with Navy carriers in Korea, is described as the first supersonic fighter with an initial rate of climb of 9,000 ft./min. as a recent company announcement.

► Most likely theory that its in the development of a emergency landing gear for an Eastern Air Lines Constellation in a field south of Richmond, Va., in July, is that the storm through which the plane was flying struck upon its hydraulic access door near the upper leading edge of the wing. The storm door set up a vibration which shook the aircraft violently causing the pilot to decide on an emergency landing.

► An Allison J35 turbojet engine tested the 1,000-hp. mark without major overhaul on Aug. 17 at Hawthorne AFB, California. The engine, delivered to the 7th Fighter Group at Hawthorne in 1959, had powered seven different F-4s, underwent six major repairs at a total cost of \$5,536. It has been shipped to Oklahoma City AF depot for overhaul.

► Massachusetts-Hawthorne is producing a highly sensitive "mini-gun" presently used for meeting any demands in light of some guided missiles. The gun was an M16 gun, but by several after manufacturing in expanded after production engineering aircraft (Hawthorne), however, still remains as out of two from its production line. Another new well which adds pilot and approach complex development by Massachusetts-Hawthorne fast reported in American Week Jan. 1, p. 35, and subsequently placed on classified list by Navy Dept.

► Transfer of USAF purchase interest activity from Wright-Patterson AFB to the new joint USAF-Navy Fairchild Development Center at El Centro, Calif., NAS, points toward greater coordination of production and standardization of aircraft for both services. Evaluations will be made on purchase engine systems, aircraft supply systems, aircraft recovery systems and parachute air brakes.

► General's XE-101 two-engine gun aircraft plane now fitted with new landing gear permitting loads at gross weights up to 130,000 lb. is expected to get USAF version for a proposed transcontinental as used test run on test, if the Test Office Department will okay the experiment.

► Continental Can Co. recently purchased the Dickinson Can Co. of Coffeyville, Kan., a small subcontractor on the Boeing B-47 program. This is one of the company's first moves to get into the growing aviation production field, as its civilian business began to feel the effects of materials shortages.

Washington Roundup

Race for Atomic Weapons

Competition among the three services for applicants of the atomic tactical weapons that probably hold the key to future military strategy is sharpening.

Air Force has won part of the race. Major statements by USAF's Secretary Theron F. Fletcher and Chief of Staff Gen. Hoyt Vandenberg overlooked the long-range bomber and the accelerating atomic bomb, respectively. They reflect USAF's new role of wiping out mass armies through threats of atomic warfare and missiles (see boxed insert).

Army's Chief of Staff, Gen. J. Lawton Collins, was first, last January, to announce the future of armor tank weapons. He shut Atomic artillery and radioactive darts for tactical attack and atomized missiles for advance thrusts, but maintained the need of tactical support for ground actions.

The looming strategy of wiping out mass armies holds three fundamental advantages over strategic beach head tactics.

- It doesn't take the usual time of disintegrating concentrations.
- It opens the way for "holding" territory—learning the prospect for the reconstruction battles that come from "beating out" enemy henchmen. This dovetails with U.S.'s foreign policy idea of winning after-often nations and ensuring that their resources will be over-run.

Fletcher complained: Air Force is planning new atomic weapons of tremendous striking power that could "bring atomic power to bear directly on the enemy's ground forces. Here we are entering into a new terrain and we seek to use all the ingredients we possess in an effort to be effective and will make of atomic weapons against possible targets in the ground battle area."

Vandenberg explained Atomic tests have "created a new reason for the air-metastasis on the battlefield."

Air Power Build-Up Postponed

A boost in air power goals is out for another year. But an increase in present air power targets—a 55-wing Air Force and 15 carrier group Naval air group—by 1955 final year—will start next July 1—on a fiscal basis.

"That is the word top Defense Department officials have passed on to the Senate Appropriations Committee."

Reason for the postponement: Maturity of plans, parts and equipment can't handle the additional production load. Senate Appropriations Committee says Administration has "slid-dithered" in getting mobilization underway and smoothly rolling, this complex.

Capacity is already being strained to meet even under the 45-wing program, defense chiefs assure. Delays are lagging, and with them, USAF and Navy expand teams for place buying. Senate Appropriations Committee is going to convert a substantial part of the \$10 billion for USAF and the \$1 billion for Navy aircraft procurement in the \$40 billion 1955 final year budget from cash to contract authorizations.

One committee member explained: "What's the point of appropriating more money and letting orders to gather dust in bin for mother year? What we're going to be doing between now and next July is expand the productive capacity to build the planes for a 1951 or 1952 wing Air Force and bigger Naval air arm—not build the planes for 1955 wings."

The administration is expected to ask for \$3 billion more for the services shortly—largely to step up industrial production.

But don't look for additional funds this year for aircraft procurement, unless substantial developments shakeg Administration plans.

Senate Fight?

As the time for decision on the future military program draws near, inter-service rivalry is prevailing in these quarters. This is the outlook.

First showdown is due this week in the Senate. Sen. Henry Cabot Lodge wants to tack back to a 1950 wing Air Force, plus one's \$10-billion budget and, in effect, shove the USAF buildup down the Pentagon's throat.

But, Lodge's move will probably backfire. Administration leaders will point out: Military chiefs are increasing the defense program, including the air power build-up, to let these decide it. Must ensure, under any swelling federal spending, are likely to follow.

Sen. Robert Taft's campaign for an all-out build-up of strategic air power in line of a "ground war" specifies in Europe for strategic, a federal, Taft and his associates can't go to try to slash Army funds and channel them into USAF as they agreed months back.

Taft's military policy now is: Since the Administration has committed the U. S. to defend Europe, Congress should support Gen. Dwight Eisenhower's efforts.

Pentagon Fight?

The Joint Chiefs of Staff and Secretary of Defense are scheduled to decide over all policy questions and agree at a 1955 final year military program on Sept. 10. The program then goes to the Administration for review. The crux of inter-service differences: Navy wants USAF's ceiling at around 100 wings, emphasizing expansion of Naval air. And Army and USAF are at odds over tactical aviation.

Open Fight?

A certain degree of friction exists between House Armed Services Committee since inevitable shortly after members action first session Sept. 12.

The time is long past due to change the statute that sets USAF's strength at "not exceed 70 groups." And committee chairman Carl Vinson wants to grab the ball from the Administration in detouring the new air power derivatives.

Department of Defense has asked a sample recap of the strength program. This would leave USAF's air in Administration domain.

Vinson wants authorization for 160 wings, including 155 combat wings—more modest than the Lodge proposal for 170 combat wings—split out in his Committee members, led by Rep. Sterling Cole, want two more at the point of severe delinquency paid out the benefits on USAF's future commitments.

- A comparative evaluation of Navy, Marine, and USAF tactical air techniques.
- Transfer of USAF's tactical air arm to Army control.

—Katharine Johnson

Materials Lack Hampers Plane Industry

Civilian production continues to bite into scarce supply while aircraft plants wait.

By Alexander McFarley

The U. S. aircraft industry is beginning to find out about its materials shortages—the hard way.

Controlled Materials Plan, it was anticipated, is growing (in which is getting started). The burden of U. S. air power is definitely being the quick of scarce materials and will continue to feel it through the fourth quarter of this year and well into 1952, before additional materials capacity can be obtained.

Production Facts—Despite any program for increased air power which the Department of Defense may envision, the aircraft industry is facing a number of problems.

- Civil production. The continuing high rate of civilian production is taking a large share of available materials.
- Aircraft production, along with other defense production, is not getting what it is asking for.

Meanwhile, on Capitol Hill, there is a paradoxical situation (See Washington Roundup). Congressional sentiment is to cut back on civilian production as far as possible, with the promise of additional funds, if they were provided.

Structural Steel—One of the most acute blocks on early growth of aircraft production capacity is the shortage in structural steel. Alloys for structural steel are being made on a basis of the experience of construction to the defense program. The military services are looking out for their own new large expansion and construction and such groups as the Atomic Energy Commission have the highest priority ratings. Then too, there is high priority for construction of additional nuclear test facilities and for construction of additional facilities for production of steel and aluminum.

That lower aircraft plant programs (although they are the direct military aircraft production, in many cases) will have the priority list.

For example, Lockheed and Northrop, builders of mid-engine twin-engine fighters, are having to cut back on their aircraft production, in many cases, will have the priority list.

Representative Cooper, U. S. 2 and 1 in a number of cases, U. S. aircraft plant expansion is shorted on structural steel by production given foreign building programs, it is reported.

Controlled Materials Plan. Pentagon sources discuss the across-the-board slash which the Aircraft Production Resources Agency had made on registered aircraft plant allocations for the third quarter, as a "temporary solution" to a bad problem that had to be solved "quickly." It is understood that virtually all the aircraft manufacturers have filed for restoration of allocations but that many few restorations could be made under the total amount of controlled materials which were slated to be allocated for aircraft.

While virtually all the manufacturers also have filed for increased allocations in the fourth quarter, claims filed, equally due, for increased aircraft materials allocations then.

Mechanical Tools—Scarcity also in the mechanical tool bottleneck has caused tooling capacity problems are on their way to solution, with the promise of additional funds for tooling, with high priority on building equipment going to the aircraft tool plant capacity.

But the recent statement of Clay F.

Redford, Deputy Defense Production Administrator for procurement and production, is probably too soon, aircraft people believe, when he says: "The road is now clear, the machine tool industry is steadily increasing its output and we will get the machine tools we need without further delay."

Some other relief steps that are being contemplated by government would include higher allocations of Navy machine tools now available in Navy facilities for new defense production. One suggestion is to take the tools from the facilities, but another which the Navy prefers is to have them added on the production line.

Forging Shortages—A critical tooling situation in aircraft forgings continues as a result of after effects of the Alcoa large plant strike in Cleveland. A secondary large plant which Wilco Overland is operating at, Erie, Pa., is not yet getting an high rate of production due to shortage of skilled workers, principally the makers and heat-treaters.

Changing the heart of the forgings tool capacity are the Cleveland plant and the Wyman-Corbin Co. at Worcester, Mass. While Alcoa (Aluminum Co. of Canada Ltd.) is working strenuously after the forgings picture in this country, despite acquisition of some American production.

AFB's Right Spin—Seen in a light spot in the overall scene is the report of Harold (HAR) Boyer, Aircraft Pro-



WHEN THE BOTTOM IS LOWERED
Fairchild XC-120 Fair Plane was among static display planes at National Air Races.

Below: Interesting fact shows belly construction when jacks is detailed.

we're best in the business in close support tactics, as in these missions. But it is not the same mission as a large land air force with an unaccompanied garter mission," Wolfenberger explained.

There are some, Wolfenberger continued, who believe that USAF tactical aviation should be broken up into "pony packs" and controlled at division headquarters and corps headquarters levels. This is far from the "bicycle" point of view, he continued, but would require the overall mobility of tactical aviation for which the Air Force is responsible.

■ Major, AF Mission-Matrix: Close aviation, it was pointed out, was not set up specifically for support of its combat troops and is less than one tenth the size of USAF. The Air Force, at the same time, has four power sources of which tactical support is one. Strategic and defense air carry plenty over tactical air, and spokesmen explained. "Scenarios of enemy ground troops through vast quantities and types of tactical assets would be ideal. We would like to provide it for our troops but unfortunately Air Force battle environments forbid it," he said.

General Clark was very outspoken in his demands for unified air mobility of his troops and the need for close tactical support by USAF. He declared "we are going to get the best close air support we can obtain for the infantry, and I'm positive we'll get it before we're through."

He indicated that there were considerable issues at which Army and Air Force were at odds on policymaking levels but he said that he felt sure that there would be no real difficulty. The main issue, he said, was that of operational control.

Inclusion of General Wolfenberger's statements is relevant to "pony packs" tactical air units. Clark said, "I have of no responsible person in the United States Army who wants it or needs it to do believe," he said, "that operational control of tactical air support should be given over to the ground commander during the conduct of ground battle."

Later in summation of General Smith's Fair, one Air Force officer described the war was gone in a completely successful maneuver training exercise for Army troops, but which is inadequate from Air Force point of view. "We are so short of aircraft—even observation types—that most of our participation has had to be simulated. The boys have done some wonderful flying during the past week. But the equipment? Well it's like riding a horse in the presence of Hitler!" General Van Vorst said right when he said we had a deficiency in Air Force."

■ The Shooting—Vandenberg was recently taken to talk in Congress for



AMBULANCE SERVICES is one of the uses to which the modified Beaver can be put.

Busy Beaver

Army, AF will share in procurement of 185 light transports.

Army and Air Force will share procurement costs of approximately 185 Canadian-built de Havilland Beaver light transports, it was declared recently. Under an agreement between the two services USAF will waive Army air craft weight limitations to permit Army to secure some directly needed air transport.

Nearly seven hundred aircraft would be needed, but an Army spokesman said the division of planes would be almost equal, with Army getting a slightly larger share. Dollar content of the contract was not disclosed, although an industry source in Washington indicated that production costs of the planes included in the order would approximate \$12,000 each. That would place total unit procurement at about \$3 million.

■ Army Beaver: The Army is procuring the Beaver primarily for use as a multi-place personnel transport, although undoubtedly the plane would be used occasionally as a light-duty transport and in field liaison, including courier and messenger service, light supply dropping, aerial evacuation, visual communication, river crossing control, aerial wire line communication, etc.

■ Air Force Beaver: While some Beavers will probably find their way into various liaison-type missions for liaison work, the bulk of the USAF planes are scheduled for delivery to Air Rescue Service.

ARS officers have long sought procurement of the Beaver for activities in

prohibited remarks attributed to him declaring that USAF was operating a "hoarding" force.

Air Force was taking part in the next Army-Air Force exercises were 9th Air Force: 107th Tactical Recon Group, with the 10th Fighter-Bomb

the 5th North, having watched its performance by both Canadian military and civilian units in the Canadian Northwest and in Alaska.

Design of the plane as a Canadian built plane was based upon results of a survey conducted among almost 300 land operators from coast to coast who reported craft under greatly varying climatic and geographical conditions. The first prototype flew in August, 1947.

Wingspan of the Beaver is 46 ft., length is 30 ft. 3 in., height is 10 ft. 7 in. Powered by a single Pratt & Whitney R-985 Wing Junior developing 450 hp., the Beaver weighs 2,775 lb. empty and 4,550 lb. loaded.

■ Procurement: Background—Late last year Air Force agreed to an evaluation of various liaison-type aircraft including the Army Commander, Ryan Navion, Cessna 195, Adu H-18, Bellanca Skyrocket and the de Havilland Beaver (Aviation Week Dec 16, p. 15).

Military requirements for the competition included that the competing planes be able to take off over a 50-ft. obstacle, land at least within 50 ft., and land over a 50 ft. obstacle within 600 ft. The planes also had to have a rate of climb, an level, of at least 1,000 ft. the first minute a maximum endurance of at least 5 hr., a cruising speed of at least 130 knots, plus a hovering speed with full control of not more than 50 knots, a service ceiling of 15,000 ft., and a radius of action of at least 200 miles and 100 miles.

Air Force specifications further included that the planes must be operable in temperature ranges from -20° to 120°F, and with movement of modification kits to convert the tri-55V. The competition was completed in two weeks during December, 1970, and won by the Beaver.

Wing, 352nd Tactical Reconnaissance Wing, 157th Fighter Bomb Wing, 340th Fighter Bomb Wing, 121st Fighter Bomb Wing, 117th Tactical Reconnaissance Wing, and 10th Bomb Squadron. Troop carrier detail was performed by the 10th Air Force.



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of fire due to broken hydraulic lines, those protecting passengers, personnel and the multi-million-dollar investment in aircraft.

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AERONAUTICAL ENGINEERING

Refinements Aid Metal Fatigue Studies

Special testing units developed at National Bureau of Standards afford better control and more speed.

Fatigue testing of aircraft metals will be facilitated with new instruments developed at the National Bureau of Standards.

These new test assemblies include devices for stopping the testing process when a small crack forms in the specimen, apparatus for automatic polishing of specimens, and a machine for testing this sort of breaking. All were developed by NBS technician John A. Boush and James E. Baker.

► **Stopping Control**—Fatigue fracture occurs in two stages. In the first stage the metal is subjected to decreasing stress until a small crack forms. In the second stage, the crack grows until the member's remaining cross section is too small to support the applied load, and complete fracture takes place.

In fatigue studies it usually is desirable to determine the number of cycles of stress required to start the crack, as well as the number to complete the fracture. These determinations are facilitated if the testing machine can be stopped automatically when a small crack forms. The two stopping devices for this purpose, already have been put into operation at NBS.

In a typical testing machine the 0.25-in. diameter specimen is clamped into a grip and an electric beam supported at the ends only from the specimen and loaded at the ends near the specimen by weights hung on shackles.

The loading shackle is attached to the bearing house, and the deflection measures when a crack forms in the specimen. If the crack is only on one side of the specimen, the deflection will vary periodically with each revolution of the specimen's drive shaft.

Each deflection and the electric beam are used to activate the NBS stopping device. One circuit is deflection-responsive, the other is vibration responsive. The two are used separately, with their circuits connected in parallel. Sometimes one will respond first, sometimes the other, depending on the personalities of the particular specimen test.

► **Deflection Stop**—The deflection is measured stopping device consists of a Micro Switch operated by a lever fastened rigidly to one of the bearing house, the other end carrying an adjusting screw which bears on the Micro Switch's actuating leaf.

After the specimen has run long enough to reach temperature equilibrium, the adjusting screw is adjusted until a very small change in the position of the leaf will trip the Micro Switch and shut off the machine. With careful adjustment, the measurement is sensitive to cracks having a length of as little as 5 to 10% of the specimen's circumference.

► **Vibration Stop**—The vibration response stopping device, also fastened rigidly to one of the bearing house, consists of a steel ball joined to a thin piezoelectric vibrator. Vibrations resulting from an impact crack in one side of the specimen shake the ball from its position. In falling, the ball closes an electrical circuit that shuts off the machine.

Sensitivity of the device may be adjusted by varying the spring force of the piezoelectric rings.

► **Polishing Refinement**—The surface condition of test specimens has an important effect on fatigue. Better results are made as uniform as possible. Two pieces of apparatus developed by NBS, both entirely automatic, make possible quick displacement of the polishing operation from one specimen to the next.



CYCLOPEAN EYE

Production Finishing C-119 mounts new high resolution of guide pulk between, part of BLS gear. Nose cap removed by turning first screw, making actions which usually was carried on external tools.

In finishing specimens it is important that the direction of polishing be parallel to the direction of the stress to be applied in the fatigue test. This avoids stress concentrations at the ends of the scratches. It also is important that specimens be light to avoid excessive surface cold-working. If these requirements are met, the surface need not be extremely smooth or highly polished.

Two types of specimens, smooth and notched, are used in NBS fatigue tests. The smooth specimens have last sections of five circular ends. The notched specimens, used when stress concentration is desired, have either a fillet of definite radius at each end or a cylindrical notched section, or a semi-circular groove with a semi-circular root.

If smooth with smooth and with notched specimens are to be compared, it is essential that the surface preparation of the two specimens be as much alike as possible.

► **Smooth Specimens Handled**—The machine for finishing smooth specimens consists essentially of three parts: a wheel carrying an abrasive, a motor for supporting and rotating the specimen during the polishing operation, and a means for moving the specimen across the belt during polishing.

The wheel consists of a large rubber wheel of about 30-in. diameter, rotating outward from a hub, which press against the abrasive belt. This arrangement conforms the abrasive belt to the contour of the specimen and insures uniform pressure. The specimen is rotated at a rate which bears a constant relation (1 to 100) to the rotation of the abrasive wheel. Because the spin rate is constant about the axis of the belt, fresh abrasives are continuously brought into use, resulting in a cutting rather than a rubbing action. A rubbing action should be avoided, since it tends to produce more crack work in the specimen surface.

► **Notched Specimens Finished**—The apparatus for finishing notched (fillet or groove) specimens is new only in a few details. It carries essentially of an abrasive-charged wheel which rotates against the bottom of the notch while the specimen is slowly rotated.

The specimen is held in a small bench lathe. A screw actuator, mounted on the controlled guide with its axis of rotation perpendicular to the axis of the specimen, drives the polishing wheel.



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The lightest stage of stress will break first. After this specimen has been removed and the number of cycles is counted, the constant assembly is moved to the next operation and the machine restarted.

Because to meet an stress specimen can be tested at once, the fatigue group of the material can be determined over a wide range of maximum stress values in a relatively short time.

SBAC Exhibit to Show New Stars

(McGraw-Hill World News)

London—More than 50 aircraft will be shown at the 12th Biennial of British Aircraft Constructors flying display and exhibition, Sept. 11-16 at Farnborough. Top drawing made will be Britain's two brand-new fighters, the Hawker P. 1067 (Avonon Work Aug. 6, p. 6) and the production model of the

Vickers Supermarine Swift, both produced by Rolls-Royce Avon engines.

The Vulcan Valiant, four-engined, Atom-powered bomber, which greatly impressed General Hoyt Henshaw, will also be shown.

SBAC hopes that another two or three "bunny" fighters, still in the second lot, will complete their test flights in time to make the show.

The English Electric Canberra will be on display in some new role.

All of Britain's following aircraft will be on hand—the new Avon 777A, the older Avon 707A, the Beaufort P. 113, and the Fawcett P. 12. The world's largest aircraft—the Bristol Britannia MK-1 will also appear.

In the engine hall, most interest will center around the Napier Nomad, a compound engine designed for long-range transport for bombers.

Flying test bed displays of the Avon strong Siskadee Sapphire will also be made at the show.



FUEL SYSTEM has jet engine in stand in lab facility that gives flight sensation

Fuel Action Studied In Lab 'Flight'

Jet fighter fuel system research and development is being sped at Republic Aviation Corp. with a special test setup simulating an actual installation in flight.

This fuel system arrangement, complete with provisions for external tanks, is installed on a cartage which can be positioned by hydraulic controls for several situations at flight.

Fuel can be injected into the system at several hundred gallons per minute from a 10,000 gal. reservoir, and flow, temperature and pressure can be measured at about 25 locations.

Tests have been made to study the effects of full and partial of the phase under various combinations of altitude, speed and temperature during "tanker fuel transfer operations." Effects of contaminated fuel have been studied and procedures for cutting off portions of the system which become impervious as a result of battle damage.

Considerable work was done in the facility with Republic's F-84G installation. This is the AF's first jet-powered jet fighter equipped with no in-flight refueling system (Aviation Week June 18)



CLASS 88000 at Langley, 44 ft dia. supersonic tunnel, 10,000 ft. long, and flow type, rated at 500,000 cfm at a pressure ratio of 5. Rate weighs 15 tons, runs at 1,500 rpm, is 21 ft. diameter, has 1,177 blades. A large wall time it



COOLERS are installed across one elbow of NACA 6401 tunnel. Reversing segment allows in capacity of cooling plant.

New Power Extends Tunnel Data Range

About three years after its first run, the NACA 6401 supersonic wind tunnel has been improved by its power section.

The additional power has not been used to increase the velocity speed range (Mach 1.25 to Mach 2.7) but rather to

boost pressure in the test section.

Originally, tunnel operated at test section stagnation pressure of 4 atmospheres, supplying less than 100 ft. of air to go from there to 7 atm. T.V. side available range of test section pressures means that a large variation in test Reynolds number can be obtained.

Reversing of the tunnel's main added complications in tunnel control system or NACA took advantage of

the structure and redesigned the control panel. It was planned as a one-piece, horizontal unit, with controls laid in the appropriate location on a large display, relief of the tunnel itself. Color coded lines marked the location of air valves and other controls.

The new panel is expected to reduce errors in operation of the tunnel and to reduce the time required to take operation.



VALVE LOCK, (above left) a guideline-type valve, sets windward test section so that technicians can work inside tunnel pressure. Removable of dry air stream of different pressure in test section. Turbomachinery segment valves blend in with air, are part of system control system, and not subject to air lock. Should D. Thick 5/8 in. band of 4 by 4 ft. supersonic tunnel crutches in test section bearing waste model.



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REYNOLDS ALUMINUM

MODERN DESIGN HAS ALUMINUM IN MIND



NEW DELTA CONFIGURATION, British Avro 707A, has a high, sweeping wing leading gear track and sharply tipped wing.

Avro 707A

New aircraft features
wing root inlets and
boundary layer fence,

For the first time in a row, A. V. Roe & Co. Ltd., Manchester, England, has revealed a new delta-winged aircraft just before the Sept. 11-12 show of the Society of British Aircraft Constructors. This year's model is designated the 707A, and differs from its predecessor in having wing root inlets for the turbulent engine intake of a dorsal finless inlet.

First 707 entered shortly after the 1949 SBAC show, the second—the B model—was in the static display at the 1950 show (Aviation Week, Oct. 5, 1950, p. 20).

• **As a delta**—The series of delta built by Avro has been powered by Rolls-Royce Derwent engines. In the 707 and the 707A, air for the engine was taken as bled through a dorsally mounted no inlet of obviously low efficiency. The reason for such a location was that at the time there just wasn't any other place to take air in.

But the later 707A uses softer conventional wing inlets with a boundary-layer fence between the inlet and the fuselage. These inlets appear to be the only difference between the A and its older sister.

Apparently Avro has done something about the inlets on the 707A as well. That company's latest advancement in the Acropolis, July 17, shows considerable work in the form of the air intake. In its current form, the inlet resembles some of the NACA's so-called lighted inlets which were



developed later some years back, and tested, notably on the X-59, and a special Lockheed F-104. (Reports have been filed and the exact line of the scoop protrudes more into the stream than the earlier form did. It also appears that the intake face is forward of its previous location.)

These modifications should increase

the pressure at the engine inlet (which is another way of saying that it improves the fuel) and perhaps hold the recovery (area angle-of-attack) curve up through another few degrees.

The 707A is painted salmon pink, the 707B light blue.

Span of the 707A is 34 ft. 2 in., length without gear head, 34 ft. 4 in.

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—and we know what
caused it...



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Result: ...you like it—and you know what caused it.



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crushing process.



NACA Reports

► **Electronics in a Spray Foamed by Two Inexpensive Jets** (TN 2149)—by Morton F. Hoffmann and Jack C. Hoffmann.

The rocket engine, as any experienced pilot will tell you, vibrates steadily the frame between internal and external behavior. Under certain conditions, it will exhibit instability characterized by sustained oscillations. These oscillations occur at frequencies that vary from approximately 20 up to several thousand cycles per second.

The low frequency oscillation may be explained by resonance as a result where the propellant feed system and the rocket chamber are dynamically coupled. No such statement readily explains the variability at higher frequencies, however.

In the high frequency range, combustion instability appears to originate in the injection and mixing process. Because of this situation, NACA has investigated the flow characteristics and the spray pattern formed by the injection of two liquid jets.

The apparatus used provided for injection of the liquid spray pattern and also permitted variation in the spray pattern angle and the length of jet before impingement. Water was used as a liquid for all investigations, except flow, was determined from rate meter readings.

The spray was studied by stroboscopic and photostereographic techniques. High-speed motion pictures and microfilm photographs were taken of the spray pattern.

Stroboscopic results were obtained from the investigation. Upon comparison of the jets, a nullified sheet of liquid was formed perpendicular to the plane of the two jets. This sheet disintegrated immediately, forming a group of drops that appeared to arise from the point of impingement. This disintegration of the liquid sheet resulted in variable spacing between sprays, and immediate spray intensity. There was a wide variation of spray sizes.

Under constant operating conditions, the frequency of wave formation was constant over a wide range of spray intensity. As the spray intensity increased the wave frequency, as a relation which approached a direct proportionality between the impingement angle decreased the wave frequency for impingement angles between 50 and 100 degrees.

Doubling the diameter of the jet had negligible effect on wave frequency compared to the effect of jet velocity and impingement angle. Changing the jet length from 10 to 50 diameters below impingement produced negligible

effect on the frequency of the waves. Analysis of the photographic and stroboscopic data obtained shows that the nulling of the liquid sheet pertains to the point of disintegration of the sheet. Furthermore, the nulling phenomenon has properties of the wave formation. As a final note, irregularities in the jet before impingement may be of substantial in controlling the nulling of the liquid sheets as is the function of the jet.

► **Effect of Aspect Ratio on the Low-Speed Lateral Control Characteristics of Un swept Unswept Low-Speed Rate Wings** (TN 2145)—by Roger L. Nusselt and William M. O'Hare.

This report is intended to add to the work which has been done to determine lateral control characteristics of wings with aspect ratios of less than 5. These nonlateral terms were made on a series of swept unswept wings of aspect ratios 1.15, 2.15, 3.15, and 5.15. The wings were fitted with aileron slots of 25% chord with various span and various spanwise locations.

The results of this test indicated the following conclusions:

- The variation of experimental lateral effectiveness with aspect ratio could not be accurately predicted, for all cases of ailerons, by any one of the theoretical methods with which comparison was made.
- Problems associated with aileron pressure measurements became more serious with lower lift coefficient for sweep angles of moderately low aspect ratio. This holds partial flow separation in characteristic of the wings in the lower lift range.
- Aileron effectiveness decreased as aspect ratio or wing aspect ratio was decreased.

► **Effect of Tail Section on the Base Drag of a Body of Revolution at Mach Numbers of 1.5 and 2.0** (TN 2150)—by J. Richard Spiller and Robert K. Dikman.

This report summarizes the results of wind-tunnel tests performed at Mach numbers of 1.5 and 2.0 to investigate the influence of tail surfaces on the base drag of the body of revolution. Geometrically, the body of revolution was without longitudinal tail surfaces; the tail surfaces were of rectangular plan form with aspect ratio 2.74 and of a symmetrical, airfoil-like section. The boundary layer of the body was turbulent.

The addition of these tail surfaces with leading edges at an angle to the base line caused a large increase in the base drag coefficient. For 16% thick sections, this increase was about 70% with a Mach number of 1.5 and 50% at a Mach number of 2.0. By moving the trailing edge of the tail forward as measured at the base by about 1 chord

length, the base-drag increment was reduced to nearly 0. Increases due to the presence of a 10% thick tail were gradually twice those for 5% thick tail-drag increments due to the presence of a cylindrical tail was less than twice those for a plane tail.

Separation of the aileron pressure field on to the base pressure field to load the body was used to estimate the change in base pressure. Comparing this estimate with the experimental values indicated in most cases that the trend in the variation of the base drag could be predicted by this approximate method. However, in most tail locations, the qualitative agreement was poor.

Two numerical methods have been developed using operational tables. They are used to calculate the loading load of a wing section of aileron subjected to pure bending. The basic assumption is that of a simplified structure which includes only the most highly stressed portion of the cylinder. The first of the two methods uses a 14-term determinant, and the second method requires the solution of a single 10-term determinant. The loading loads of 1 cylinders with widely different characteristics were calculated by these methods, and reasonable agreement was obtained with experiment.

A procedure similar to the first method was developed for calculating the loading load of a cylinder with a vortex. A limited experimental check was obtained for this procedure.

This work was carried on at the Polytechnic Institute of Brooklyn assisted by and conducted with financial aid from NACA.

► **On the Second-Order Tunnel Wall Construction Correction in Two-Dimensional Compressible Flow** (TN 2151)—by E. E. Kleban and Keith C. Hackett.

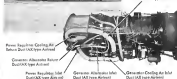
This report examines the question of tunnel wall corrections in the solution of analytical problems in the high-speed speed range by the use of wind tunnels.

The flow past thin, sharp-edged, two-dimensional bodies in closed channels is solved by means of the first- and second-order Fourier-Bessel series expansions. An expression is derived for the tunnel wall interference with the use of these solutions.

For a parabolic air inlet, the tunnel wall corrections are calculated to indicate the effect of compressibility, ratio of the tunnel length to the inlet chord, and airfoil thickness coefficient.

It appears that for cases where the tunnel wall corrections are significant, both second-order effects and the variation of the correction along the chord should be considered.

AIRTRON® Fiberglass ducting used on the twin-jet DOUGLAS SKYKNIGHT



Douglas engineers had special reasons for selecting Airtron in designing the ducting installation on the Skyknight's twin jet engines. Excessively light in weight, Airtron combines the desirable qualities of low cost, corrosion resistance, and the ability to withstand high pressure and even fires. Furthermore, Airtron's remarkable toughness and its resistance to shock and vibration make replacement in a minimum time of installation time and cost. quick diagnosis means (without time change) instant maintenance and design engineers must appreciate the advantages of ducting which actually eliminates installation problems.

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When a tool request comes in for a tool that's needed to keep production moving—that's when you realize the value of tool crib control at its best. The small investment it takes to set up a 100% system is quickly amortized (1) through increased availability of tools, accurately scheduled to meet production line demands; (2) through maximum savings, which we can readily demonstrate, on tool purchase, use, repair and maintenance and (3) through reduced tool crib personnel.

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Send for free folder, K-D-101, and get the latest story on Remington Rand Tool Crib Control, how best economically run an organized tool crib, and equipment setup to your specific needs, wherever you are in type of factory operation. Please get latest office or write: Management Controls Reference Library, Room 1208, 515 Fourth Avenue, New York 16, N.Y.



*Two systems are available to give you control of tool and by worker. In the **Remington Rand** system, signals show tools as being in use. At work the other one, **K-A-R-C-H**, **V-I-S-I-B-L-E** system, you know what tool is out, how long, when to reorder, rate of usage. This folder shows these fully equipped tool systems.

Remington Rand

Tool No.	Tool Name	Location	Status	Operator	Time
101	WRENCH	TOOL CRIB	AVAILABLE		
102	SCREWDRIVER	TOOL CRIB	AVAILABLE		
103	DRILL	TOOL CRIB	AVAILABLE		
104	SAW	TOOL CRIB	AVAILABLE		
105	GRINDER	TOOL CRIB	AVAILABLE		
106	FLAT FILE	TOOL CRIB	AVAILABLE		
107	ROUND FILE	TOOL CRIB	AVAILABLE		
108	DRILL BIT	TOOL CRIB	AVAILABLE		
109	DRILL BIT	TOOL CRIB	AVAILABLE		
110	DRILL BIT	TOOL CRIB	AVAILABLE		
111	DRILL BIT	TOOL CRIB	AVAILABLE		
112	DRILL BIT	TOOL CRIB	AVAILABLE		
113	DRILL BIT	TOOL CRIB	AVAILABLE		
114	DRILL BIT	TOOL CRIB	AVAILABLE		
115	DRILL BIT	TOOL CRIB	AVAILABLE		
116	DRILL BIT	TOOL CRIB	AVAILABLE		
117	DRILL BIT	TOOL CRIB	AVAILABLE		
118	DRILL BIT	TOOL CRIB	AVAILABLE		
119	DRILL BIT	TOOL CRIB	AVAILABLE		
120	DRILL BIT	TOOL CRIB	AVAILABLE		

AVIONICS



SPACE-SAVING DIVIDEND is illustrated (left) when master servo amplifier is put beside input and it is designed to replace an old B-47 flight simulator. The old B-47 component was servo amplifier and measuring amplifier (right).



(right) when master servo amplifier is put beside input and it is designed to replace an old B-47 flight simulator. The old B-47 component was servo amplifier and measuring amplifier (right).

Jet Trainer Parts Go Miniature

Space conservation in new B-47 flight simulator means small packages. Performance up, cost down.

Miniaturization is getting the credit in avionics components for jet flight simulators.

Packing these modern trainers with all the equipment to cost the growing demand for new operational requirements accurately simulating components of overall size of the flight simulators is not to get out of hand.

Link Avionics engineers followed the technical philosophy in the design of their new B-47 flight simulator and will extend it in upcoming models.

Drawing on their experience with the decrease SNV operational flight trainer and the F-100 and G-11A jet flight simulators, they came up with an even streamlined unit of the questioning trade.

In addition to space economy, there are other advantages—simplified production, improved performance, and easier inspection and frequent maintenance procedures.

Servo Amplifiers—Part of the main trend developed, serving as the basic design and test for the others, was a servo amplifier. This unit for a standard 50 x 100 x 100 inch chassis for on-line monitoring on the servo or computer with which it is used. Miniature tubes and new type vacuum tubes are added to fit the space-conservation scheme.

Purpose of this amplifier is to control the servo motor's directional rotation, which depends on the phase characteristics of the amplifier input signal.

This new servo amplifier, says Link, begins its compact design gives more efficiency and power, without sacrifice reliability, than the larger amplifiers formerly used.

Servo Amplifier—Another miniaturized unit is the amplifier. This was developed to replace the old unit

life gas and sustaining amplifier. It is compatible to the servo amplifier in use and serves a multiple purpose in the system functions of the trainer.

It adds multiple input signals and produces an output proportional to the sum of the input.

Input to the unit is very high on pedestal, output is very low. Hence, the amplifier can be used as an isolation stage without fear of loading problems which might otherwise exist. The input signal also may be amplified as much as 100 times without distorting the output signal.

Linear Phase Detectors—This is the third of the system miniature. Its function is to provide a d.c. output but self properly proportional to the magnitude of an a.c. input signal. Polarity of the d.c. output voltage is determined by the phase of the input signal.

An application of the linear phase detector in the trainer is in the instrument landing system, where d.c. motor movements are actuated by the detector's output current.

Oscillators—Connected into a small volume, a variable frequency oscillator furnishes the various frequencies required in radio aids navigation.

It gives stable oscillate performance with adjustable frequency range from 200 to 4,000 cycles.

Audio Amplifiers—These units also are included in the newly developed miniature.

They are capable of adding multiple inputs summing up an audio range of 0 to 10,000 cycles.

Other Detectors—Final units developed are new phase detectors, output of which indicates a relay.

Signal differences of 2 to 4 millivolts set the detector in operation, and relays are assigned or de-assigned

according to the phase characteristics of the input signal.

Other Benefits—In addition to space-saving, Link engineers designed for an distorted signal reproduction, accuracy of computation and control, and unit interchangeability with an adjustment—an important consideration for the trainer and maintenance men.

Link reports that the new units have vastly improved performance over the old design. They have greater accuracy and stability.

And the miniaturization, says Link, makes the units easier to produce, hence less expensive. Components are streamlined on steps or base assemblies. Leads have been shortened and chosen wiring is twisted—twisted exactly to take the strain.

Checking—Production testing and adjusting require numerous individual checks, reports Link. Units are tested against specific error reductions and, for the most part, adjustments are unnecessary. Some units are pre-adjusted before installation. And adjustments have been made against whole trainer error from new test made against field standards.

Knuts and potentiometers are virtually eliminated. And the service men can carry several units in a small kit, for replacement on the job.

Another feature complementing the miniature components in the new B-47 trainer is a common power supply. This single power package, consisting of a 17 hp. motor and two gas turbines, supplies constant line (100) and line (250) voltages for all trainer systems.

New Micrometer Measures .00002 In.

The Carson Electronics Micrometer, manufactured by the F. W. Dun Co., 1 Eagle St., Englewood, N.J., can measure thickness to 2/100,000 in.—and the measured material can be soft or compressible.

The micrometer combines electronic circuitry with an extremely accurate micrometer head, permitting "zero-in" measurement and eliminating first as a source of error, according to the manufacturer.

The circuit is designed to give a positive on and off indication with only 3/1,000,000 of an inch displacement at the contact.

Recent models are available with different work capacities for measurement on compressible or non-compressible materials, either non-coating or non-conducting. All models are portable, require no leveling and are unaffected by vibrations. They require a low-voltage line voltage as input of electronic tubes, says the company.

stability...

Strength—reliability—uniformity. These words are important when electrical connections, and especially their wire terminations, are required to serve under the most critical conditions. AMP terminals ensure a stable, positive connection, vibration-proof, corrosion-free, suitable for sensitive audio or video circuits.

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CUSTOM DRILL. DC built J-47 exhaust cone while two Keller Acrodrills accurately cut 160 hole holes through and half-inch standard drill flaps; in just 90 min.



RYAN EARLY BEAM ROLLER. Rollers welded onto in a matter of seconds.

Tailored Tools Speed Ryan Engine Work

Special modifications make for a smoother production stream.

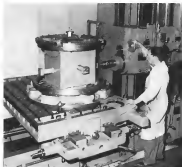
Ryan Aeronautical Corp. is getting new production gears from its engine component fabrication line with more efficient tooling.

Some of the tooling in Ryan's engine shop, others the custom of tool modifications.

► **Drill Jig-Roller** plant engineers wanted to pre-drill the hole in the gun for precision drilling of the 160 hole holes in the flaps of General Electric's J-47 exhaust cones. They came up with an answer in a company-designed and built drill jig that gives accuracy and a speed of two holes per minute.

The drill press and tool that rigidly holds the J-47 component has a hole pattern that is accurate within 0.01 in. radially. Drills are tapered to a plus 0.04 in. and minus 0.01 in.

After the cone assembly is locked in the jig, a pair of Keller Acrodrills are pushed into position so that the bits are located according to engineering specifications. A single valve proved by the operator starts the drills simultaneously and they cut through the 1 in.



GIDDINGS & LEWIS horizontal boring, drilling and milling machine is used for hole flaps, sawing and cold-chamber forgings and fabrication. Cost \$70,000.



BULLARD VERTICAL TURRET LATHE (left) features high boring mill with raised bed. Tuckman hydraulic diplocator (right) converts Bullard vertical turret lathe into an automatic production tool.



standard steel flange and return to start-up position without suspension. This automatic return is controlled by a limit switch which functions when drill bit has gone acquired distance.

The entire job is automated in a steel tank. A motor-driven pump opens the cutting arm with a water-filled ball seal, which is collected in the tank for recirculation.

After drilling, the jet arm is placed in a beta-built chamber to remove any tungsten without undisturbing the flange.

► **Seam Raker**—Another Ryan designed machine—a special seam mill—drugs speeding up the job of smoothing Helios' welded seams on tubular steel ten-rod control sections.

Formerly, these parts were welded with filler not added, and the resultant ridge of metal at the seam was ground away by hand, with a power-driven grinder. The system consumes substantial time to remove the excess metal for a smooth finish.

With the new seam roller, it is now possible to roll the seam by Helios without filler weld. The welded seams are placed between the roller's two steel wheels, which exert heavy pressure to flatten the weld seam, improving the seal quality by refilling the grain structure. Only a few seconds are required to cut each section through.

The roller requires but 1 hp. The operator simply places the section between the two wheels and depress a foot switch. This actuates an air cylinder which forces the upper roll against the part and the lower roll. A pressure-actuated switch in the air line automatically starts the motor and stops roll, to draw the section between the two wheels.

► **Helios Large Press**—Ryan's tool manufacturing department has added a horizontal blow, roller and miller unit

to its complement of machine tools made by Gish and Lewis Machine and Co., the company's multi-purpose unit has an unusually large bed and open type structure, specially built for handling large, awkward and odd shaped castings or fabrications. It has wide flexibility, for efficient use with work pieces, short runs or quantity production.

Paul Ryan, Ryan's tool manufacturing supervisor, says that the tool affords a new opportunity to reduce costs substantially on machining large tools. The reports that formerly a required about 16 in. to drill and bore the cutting positioning holes in the J-47 jet engine tools for the turbine. Drill punch had to be located by hand, using temporary templates and a calculated scale because of the large size of the tooling.

Now, the J-47 tool is placed in the new machine and the holes located and drilled using the machine's precision scale. This arrangement cuts the time for the operation to 8 hr.

Typical production-type jobs performed on the machine are couplings, hub boring and milling of large one and short sections for large jet engines.

Working 10,000 lb, the machine recognizes sufficient mass and size to assure precision work over a large size. It costs \$31,500, but labor savings should offset this investment.

► **Tall Lathe**—Ryan is now using a vertical turret lathe with the highest boring mill with raised bed repeatedly set installed on the West Coast. The new machine—a 32-in., 15-ft-long Bullard lathe—has 24 in. of extra length for its bed in comparison to the standard vertical lathe.

This higher bed places the 64-in.-diameter turning table in the most advantageous position for speeded milling of exceptionally flat parts. Metal working, measuring from 5 to just under 54 in.

high accuracy turned on the lathe. With this machine, production of the 48-in. external fuel tank ring should be stepped up 25% over previous methods. And production rates should be boosted for steel rings, all brass and other jet engine parts.

One new operator, the lathe's gas control area to set oil intervals which in turn hydraulically actuate gear changes for rotational speeds up to 160 rpm on the table or stand.

► **Diplocator on Lathe**—Ryan has taken another Bullard vertical turret lathe and fitted it with a Tuckman hydraulic diplocator—a high-production machine, at reported capacity of stripping up machining speeds, smoothing sections, grinding and improving surface finish. The combination converts the vertical turret lathe into an automatic production tool with considerable time savings.

The attachment consists of a motor driven hydraulic pump supplying one ton pressure of 500 psi to a sensitive valve and master control cylinder. The valve is actuated by a touch point which feels the pattern's outline, and meters oil directly to the master cylinder. The operator's point senses the outside shape supporting the cutting tool.

A typical application of the hookup is in machining exhaust cone flanges for the J-47 jet. A template containing the flange contour is clamped to the tracer table. The touch point is located on the template and the cutting tool positioned on the flange in exact relationship by means of a computerized dial locating unit. With the diplocator operating, the cutting tool meters and faithfully follows the direction of the tracer. Automatic in diplocator system variation of .002 in. are obtained with the equipment.

Ryan reports that this method of generating work shapes from a model has many advantages over conventional methods. The machine, continuous operation at the turner's touch power has completed with the diplocator's floating sensor probes work of "uninterrupted" accuracy. Also, it eliminates the use of costly form tools and permits use of conventional tools which are simple to set up.

The diplocator adds \$5,000 to the cost of the \$21,000 Bullard, but its speed work and time savings, Ryan says, more than compensate for the investment and because of its automatic features, the tool allows an operator to handle intricate, high-quality jobs.

Mammoth Press

A new giant measuring tool will soon begin operation at Lockheed Aircraft Co.

The latest addition to Lockheed's production might is on 3,000-ton cap-

acity hydraulic forming press, weighing 27 million lb. It was designed by company engineers for fabrication of integral stiffened aircraft structures. It was built by Bethlehem Steel Foundry & Machine Co. and represents an investment of \$750,000.

The press will make possible the production of wing sections and other parts in solid pieces as large as 10 x 30 ft. It can be used for forming work requiring mating dies, sheet-forming and for solder and weld.

Operation will be by a single attend all, although controls will be placed at all four corners for safety.

The new machine will take a 38-ft-diameter fuselage 6 ft thick, requiring 270 sq yd of concrete and 15 tons of reinforcing steel. Floor will be supported from surrounding area to select support blocks.

USAF CONTRACTS

Recent Air Force contracts awarded by Air Material Command have included awards for photographic supplies and equipment, maintenance tools, flight instrument and for training programs at various schools. Some recent contracts:

Strategic Instrument Corp., Lexington, MA, 1000 S. 100-101.
RFP 6-64, Moore Co., Philadelphia, Pennsylvania, CO, 100-101-101.
AC Supply Co., 100-101-101.
Pitts, MA, 100-101-101.
100-101-101.

Armstrong Precision Co., New Bedford, Mass., 100-101-101.
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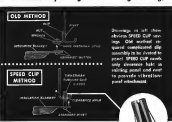
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100-101-101.
100-101-101.



"Flying Workhorse" picks up 71% assembly savings... 73% weight savings



Powell Helicopter Corporation uses Tuckman SPEED CLIPS® to make spot-reducer savings over previous method of attaching blower insulation.

The "flying workhorse" for the Air Force and the Army, Powells new helicopter carries about a replaceable example of the new structure.

Blower insulation has to be attached inside the rotor hub over 700 locations. The old method required manual screwing to save assembly time and, even so, was not perfect. The perfect answer is Tuckman's clip and standard design. They could also be the place of complicated previous methods, and provide an amazing 71% assembly saving, and actual weight savings of 73%.

New Tuckman Tubular Clips, along with standard other items, are specified for use on all new HUH-1 craft and also are used on the new Powells HO-4S, Air Force Army and Army Transport helicopters.

With today's production schedules—and budgets—it's well worth while to "lock" the Tuckman HO-4S into "new" design. "Why for more reasons why," answered in new 24-page booklet "A Story of Quality." TUCKMAN PRODUCTS, INC., Dept. 12, Box 5668, Cleveland 1, Ohio. Distributor: Air Associates, Inc., Hawthorne, New Jersey.

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Higher speeds. Greater stresses. Tighter performance standards. All these put new demands on aluminum. Working closely with aircraft producers, and to meet their needs, Alcoa research has created a new alloy that pushes aluminum strength limits up another 10 per cent.

It is the same type as 755... stronger. Experimental quantities are now available in sheet and plate (either Alclad or bare), and extrusions.

Whether your problem, we always welcome an opportunity to pool our experience and facilities with yours in the interests of Flightmetal Designing.

ALCOA

ALUMINUM  MAGNESIUM

Ask ALCOA for the Flightmetal Training Aids you need

Alcoa's complete library of design and fabricating information is available now to help you train employees—additionally known as: What manuals do I need do you need?

Forming Alloy Aluminum. Describes methods, alloy characteristics. 42 pages.

Designing for Alloy Die Casting Applications. Design stresses, alloys, practices, finishing. 188 pages.

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Alloy Aluminum and Its Alloys. Properties and composition. 178 pages.

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ROCKET TAPERS for group instruction are available as all principal methods of aluminum fabrication.

For manual Alcoa sales office will supply books from local area. Also Alcoa ALUMINUM COMPANY OF AMERICA, 1980 Gulf Building, Pittsburgh 19, Penn.

NEW PRODUCTION TOOLS



35 to 7" diameter, also threaded in 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100. Cleveland Grinding Machine Co., Cleveland, Ohio.

Strut Grinder

A grinding machine, especially designed for work on aircraft components has been developed by the Norton Co. One of its new tools is a rod grinder which can be used to grind straight and tapered rods of circular shape which cannot be ground on standard rod cylindrical grinders. It has a swing over the table of 26 or 36 in. dia. and is available in work length capacities of 72 and 96 in. In cases of a gap, a swing capacity of 50 and 56 in. dia. is possible. This gap is adjustable on both by moving a pedestal on which the headstock rests. It may be set to any width up to 36 in.

The machine is the traveling wheel head type and a movement system of wheel head travel control is provided on the adjustable bed on a large wheel placed in front of the machine. A sword table permits grinding of taper. An automatic speed for air on parts with gas turbine also is available. Norton Co., Worcester 6, Mass.



Sheet Floater

Sheet of steel for bending into stamping presses are positively "steered up" to the operator by a "Magnetic Sheet Floater" recently placed on the market. Stamped sheets are held apart at the ends by magnetic devices, so they can be pulled up quickly by the operator and fed into the stamping press. The device minimizes difficulties encountered in trying to separate sheets with gloved hands, squish handling, and reduces chances of injury to the worker. Vance Aircraft Parts Co., 5511 S. Kenwood Ave., Chicago, Ill.

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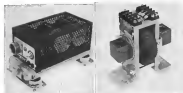
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EQUIPMENT



GROUND POWER supply unit control panel (left) maintains voltage and current regulation and associated circuits. Toroid (right) is current sensing element.

Unit Controls Jet Starter Current

Eclipse-Pioneer contemplating production of device developed to hold torque steady with low amp. loss.

The problem of excessive wear on brushes of jet engine starters, due to the great heat built up by accelerated current input, has been overcome, according to Eclipse-Pioneer, with a newly developed ground power supply unit.

With a flick of a switch, the new device automatically limits to a predetermined value the current and voltage supplied to the starter, avoiding the rapid temperature increase in the brushes and wastage of up to 1,000 ampere-equivalent in approximately 1-1/2 sec. at 25 v. The specially developed unit requires only 50 watts to operate, while the present system demands 750.

• **What Is Done—Speaking in round figures, that is what the device will do.** Suppose 1,000 amp has been selected (by setting that limit on the continuous current control) as the maximum ampage to be supplied to the generator. When the starter button is pushed, 1,000 amp are furnished the starter, no more. The actual 25 v. drops to 8 v. As starter rotates speed, 1,000 amp are continuously maintained by current (the control) and gradually raises the voltage supplied in direct proportion to the needs of the starter. When the full 25 v. starts the starter, a voltage regulator unit cuts. Naturally, the engine has caught by the time.

An important feature is that the magnet impedance by the starter on the engine reaction combined throughout the entire starting sequence. This substantial

torque limiting means that no sudden, uncontrollable, load twist the starting coil during of the engine with it (slight torque before). Engine has should therefore be prepared.

Technically called "Ground Power Supply Generator and Control," the unit is under development at the Eclipse-Pioneer division, Bendix Aviation Corp., Yonkers, N. Y. Only a few pilot models have been built to date but production quantities are contemplated. At present, 500 and 1,000 amp systems are under consideration. Effect of the power supply's control system at a toroid. This dependent shaped magnetic amplifier, the element

measuring current produced by the generator, is made up of two windings on a ring having special magnetic properties.

Principle of use, the current sensing winding, is to determine magnetically the amount of current being generated, and through a carbon pile regulator to limit the current to whatever value has been selected. The other coil, around the base winding, prevents a true no-load condition from ever occurring to the magnetic amplifier "since the base winding carries the same d.c. current as the regulator coil." When in steady state, when there is no load on the generator, the coil current would increase slowly to a point where the current regulator carbon pile would be held open.

• **How It Works—One side of a 120 v., 60-900 cycle a.c. current supply is fed through the current sensing winding of the toroid, through a half-wave rectifier, the current regulator, the base winding on the magnetic amplifier due to the other side of the a.c. supply. A standard motor is synchronized as source of the a.c. if alternating current is not already available on the power unit. A condenser is connected across the regulator and base coils to smooth out the pulsating direct current output of the half-wave rectifier and thus improve performance of the carbon pile regulator. Also connected across the regulator and base coils is a rheostat, adjustment of the latter provides means for maximum ampage setting by means of current sensed current regulator coil.**

Then the magnetic amplifier, sensing current output of the generator, signals the carbon pile current regulator how much current is flowing. Instantaneously, the regulator controls the generator, through its shunt field, to limit current imposed by a given ampere by lowering its terminal voltage.

• **Tough Toroid—Unique feature of the**

ground power supply control system is the toroid. This ring doughnut is mounted between two supporting back-ends. A single copper wire is routed through its center. Both ends have terminals to make external connections. Since the bar cannot full output of the generator, it has a large compensating area and is short in the 18-dip or power loss is equal to or less than an equivalent length of cable. Connections for the current sensing coil have windings are made through a terminal board mounted on top of the coil.

Features of the toroid are:

- **Longevity of construction**—materials used for shock, meaning the unit.
- **Simplicity and ease of maintenance** are achieved by the complete lack of moving parts.
- **Lossing of current**—approximately 30 watts are dissipated as its windings mean that no spiral proximity could be made for construction on cooling the toroid. Moreover, since several currents are measured in milliseconds, the unit may be constantly analyzed without special consideration for level length.
- **Reliability** is important and all terminals are mounted to ensure that they are properly connected.

Complete weight of the unit is 4 lb. Other components of the ground power supply unit are:

- **Maximum current control**—This is a selector switch with which an operator may choose any one of several maximum starting ampere values. One unit seen at Eclipse's plant offers four choices: 500, 1,000, 1,500 and 1,750 amp. Ampage supplied the starter will not rise above the predetermined value set into the control. Weight is one lb.

• **Control panel**—This component is made up of two parts—a tray assembly containing the control and voltage regulation plus associated circuitry and a shock-mounted base from which the tray is quickly detached. This permits removal of the unit for maintenance or inspection without having to disturb the base. Total weight is eight lb.

B. G. Adams, Eclipse assistant senior accessory electrical engineer, told Aviation Week he is confident that the compact, light weight, and robust ground supply and generator control would perform a useful and needed job in making jet engine starting easier with less wear on starter and engine side.

RAF Compass

The latest Royal Air Force and Navy jet fighters are being equipped with a new type of magnetic compass.

The 3-in. transparent plastic instrument is only as large as a golf ball.

The R2A, as it is called, mounts a compass card graduated in 10-deg. in-

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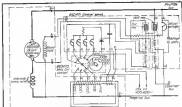
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WIRING DIAGRAM shows Eclipse-Pioneer ground power supply control circuit layout.

An Inside Look Into A Quality Chuck...

ROBT. MARSH, EDITOR
FOR



SUPREME Brand CHUCKS feature dependable one-piece construction

The one-piece construction of Supreme Brand Chucks insures the positive, dependable grip desired by those workmen who appreciate precision tools. Sturdy and rugged Supreme Brand Chucks stand up under the hardest working conditions. They are accurate... they are a quality product.

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Supreme Products, Inc., 2222 St. Calvert, Chicago, Illinois

THE CHUCK THAT LIVES UP TO ITS NAME...SUPREME

components which have a front of a laminated plastic. Screens and it used inside the instrument for damping purposes. The output works equally well in an inverted position.

The RCA unit developed by the Automotive Research Laboratories for the Ministry of Supply and is built by Kelvin and Hughes.

Electronic 'Brain' Controls Fuel Flow

Part 5 of Whetstone's latest jet engines, the powerful J57 (estimated thrust 10,000 lb.) is being equipped with a new fuel control.

The new device, developed and being produced in large quantities by Hamilton Standard division of United Aircraft Corp., combines an electronic "brain" with a hydraulic mechanism to feed the engine precise amounts of fuel for optimum operation.

Hamilton Standard's general manager, Eric Martin, said that the fuel control "has passed endurance tests on J57 engines in test cells, and flight testing now is in progress."

The fuel control, Martin said, senses the pilot's or a number of status monitoring operations of the jet engine and accurately controls the speed of the rotor assembly. Bearing units detect air inlet and tail pipe temperatures and engine rpm, then relay this information to the electronic unit. If the engine tends to exceed its design limits, the latter signals the hydraulic actuator to reduce fuel flow.

Interlocking and rapidest safety feature of the electronic unit, resulting from extensive research on the part of Offord Products Corp., Chicago, was based on study by Hamilton Standard engineers, in the duplication of vacuum tubes so that a stand by tube is always available to take over in case of failure of the first tube. Also, an automatic sub-assembly on the electronic unit is "potted" in compact housings of quick-hardening resin. Result is immunity to vibration, dust, moisture, grease, humidity and other corrosive elements. Added protection is furnished by enclosing the entire electronic unit in an airtight magnesium casing.

Although all the sub-assembly is cast in magnesium, which is used in the electronic unit, it that they can be quickly removed and replaced, eliminating the problems of removing individual circuits or metal components, tapping or misrouting by inexperienced personnel.

The unit is the second in a three Standard's expanding line of aircraft equipment to reach the production stage. The first was an air-to-air refueling unit for jet fighter aircraft, recently used in F-102 jets.

NEW AVIATION PRODUCTS



Radar Air Dryer

A new series of air filter dehydrators for drying and cleaning air supplied to pressurized rotor drives has been placed on the aircraft equipment catalog by the Radar division of Lear Inc.

Coming in cartridge sizes from 1 to 60 in r.p.m. of dehydrator, the new units provide water absorption capacity to match operating cycle demands of the pressurizing equipment. The dehydrators are located on the right side of the compressor. White vapor units and after regulators are attached with maximum efficiency and with low resistance to air passage, because air.

White vapor screens and filter pads are utilized to remove all air dust. Moisture-absorbing crystals, usable through transparent tube, are also gel. Gels A, Type TV, working specifically AND C. Characteristic colors on inside with colored color cards at 3, 33, 40 and 60% relative humidity.

Lear, Inc., Romeo division, Romeo, Ohio.

Plane Stains Erased

A nonabrasive polish that gives a gleaming, uniform shine to aluminum surfaces on aircraft without reducing the thickness of the metal has been developed by Ross Aircraft Co., Los Angeles.

The product, Raco 216, removes varnish stains and other blemishes causing aluminum skins during aircraft maintenance. It provides a finish that approaches that finish appearance, says Ross. Strictly a surface treatment, it does not remove wear caused by erosion. This requires an always agent. However, the polish does help prevent galvanic corrosion.

Raco developed the new polish when Boeing Airplane Co. requested that

some of the conventional types be used on C-97 fuselage sections being built under subcontract by Ryan. Boeing found three problems right then and the 25-year aluminum coating on the 2051 basic alloy.

Ready to use in a wet polish for the C-97 skin. Raco 216 also is being applied to skin surfaces-particularly along the inner walls-of current jet tests built by the firm. Basic engineers have found it effective, removes copper from the skin polished up during welding, thus preventing galvanic corrosion that would result if the copper were left in contact with the aluminum skin. Raco 216 is easily applied, Raco points out. It was developed by R. W. Trenchard, chemical research engineer at the firm.

Ross Aircraft Co., Los Angeles Field, San Diego 12, Calif.

Better Plane Tubing

A polybutyl methacrylate tubing (Dyneflex NLT 175) for aircraft control lines does not grow brittle or support heat degradation, especially has been developed by Extrudex, Inc.

The product is the first to meet USAF Specification 1307-A in regard both to Weight Performance AFTI, the water element. The tubing also is used to have excellent low temperature performance and high dielectric strength.

Extrudex, Inc., 1217 W. El Segundo Blvd., Hawthorne, Calif.



Shipboard Mounts

Regulated vibration isolation and mounting being constructed by welded steel, shock absorbers in air or solid loadings on aircraft carriers and on ship landings, now are being produced by the Berry Corp.

These units are designed to meet shock and vibration limits of Spec. ANE-18 and to support equipment as listed in RNC-774. Mounting bases in special sizes can be applied to meet customer's requirements.

Considerable strengthening of the framework of the mounting bases is required relative requirements has been achieved with only minor increase in

weight for types supporting loads up to 50 lb. For heavier loads, the bases are all stainless steel, instead of aluminum.

Unit vibration isolation comes from 1 in. to 18 in. air with interchangeable with other models now being used. They come both in the air-cushioned and "All-Moff" type.

The Berry Corp., Watertown, Mass.

Air Flow Switch

A new air flow switch, recently used to protect ground radar equipment, has been selected for aircraft.

The switch is a solenoid actuated, for forced air cooling to electronic equipment. It is designed to guard against tube failure. In case of flow failure or an air passage obstruction, it operates a control relay which cuts off power to the tubes. It could save, perhaps, is a similar capacity with turbine engine equipment that requires forced air cooling. And it also may be many other aircraft applications requiring a sensitive state pressure switch.

The unit is the first prototype (unpublished) switch of its pressure rating and rate, the maker believes. But further evaluation in this and weight will can be accomplished easily to meet specific aircraft requirements, the maker adds.

Henry G. Dyer, 12-16 Astoria Blvd., Long Island City 2, N. Y.

ALSO ON THE MARKET

Speed tools for aircraft (precision built and closely inspected before delivery) range from 22 to 30 gage, length from 1 to 24 in. They come with round, oval, round flat or rectangular heads. The Roberts Co., 1750 N. Indiana St., Los Angeles.

Quicker tube operation in aircraft can be achieved through use of a new tube for bonded-in metal but which isolates vibration and transmits no effects. "Bonded" between shell and fan blades. Lord Mfg. Co., Erie, Pa.

Head fasteners (Garnier, "Dr. Horn") type in a steady little instrument housing as quick major from 25 to 30,000 rpm, protected from overloading. James G. Ballek Co., 1116 Arch St., Philadelphia.

Scavengible solvent is supposed to have greatly, highly effective grease-removing and carbon-removing properties. It does not have to be heated in use, it is non-flammable and safe on hands, can be used in the cleaning of carburetors, oil strainers, etc. Chem. Chemicals Chemical Laboratories, Lancaster, Mass.

SEPTEMBER						
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ISSUE OF

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FINANCIAL

Half-Year Comparison: 1951 vs. 1950

Selected U. S. Trunk Airlines—First Six Months

AIRLINE	1951		1950		PERCENTAGE	
	TOTAL REVENUES	NET INCOME	TOTAL REVENUES	NET INCOME	TOTAL REVENUES	NET INCOME
American	\$5,245,776	\$1,822,291	\$6,179,266	\$2,224,244	85.1%	82.4%
Eastern	12,476,191	3,732,000	12,807,000	3,862,000	97.4	96.6
TWA	14,438,001	5,800,000	14,807,000	5,970,000	97.5	98.7
North	11,143,000	3,700,000	11,143,000	3,700,000	100.0	100.0
Midwest	22,947,236	4,700,000	22,947,236	4,700,000	100.0	100.0
South	12,143,000	3,700,000	12,143,000	3,700,000	100.0	100.0
U. S. A.	7,765,200	2,500,000	7,765,200	2,500,000	100.0	100.0
Midcontinent	10,400,000	3,000,000	10,400,000	3,000,000	100.0	100.0

* Includes \$10,000 profit in net income.

* For loss.

Airline Net Climbing With Traffic

Record-breaking passenger volume and mail, freight, express rise, bring leverage factor into play.

Sharp gains in airline gross revenues, together with even greater improvements in net profits are evident from the reports released by the major airlines for the first six months of this year.

Record-breaking passenger traffic has developed a far greater volume of business than the most optimistic industry officials dared to anticipate earlier this year.

Industry estimates place total revenue passenger miles for the domestic trunk lines for the first six months of 1951 at around 5.15 billion, up some 45% over mileage for the same period a year ago.

This upward in passenger traffic is mostly responsible for the major gains in gross revenues of the air carrier. While mail, express and freight volume are up, these categories account for a much smaller percentage of the total business of most of the nation's major airlines.

Leverage Factor—Inherently, there is tremendous leverage in airline operations. Once operating costs are covered, virtually all additional revenue accrues flow through to net. Operating costs are about the same whether 25 or 50 passengers are carried on a flight. This leverage factor had its important effect on net income during the first half of this year. In the past, for most airlines, the earlier months of the year were usually disappointing and brought heavy losses in operations. All the short of break-even points. Such year ends an increasing number of airlines reporting profits in the first half

in place of the losses in common in the past.

Seasonal characteristics are becoming less pronounced in the operations of most airlines. This is due primarily to the greater safety expenses, increased dependability in all types of weather, and aggressive promotional efforts such as coach and other devices to broaden air travel markets.

Seasonal Effect—The smoothening out of the seasonal fluctuations in air travel is of tremendous value for earnings and serves to compound net profits.

A large percentage of annual airline expenditures, such as the bulk of ground and airframe expenses and depreciation, is controlled by the level of peak traffic volume rather than the year rather than by the average of total traffic volume. In other words, current costs carry greatly increased traffic loads during all peak periods without proportionate increases in their overhead expenditures, if such traffic was available. The impact of such a condition results in substantial net earnings during the year when seasonal variations were at their lowest.

This same phenomenon was quite pronounced during the first half of 1951. The accompanying table reveals the comparative gross revenues and net income for the first six months of 1951 and 1950 for the Big Four and other trunklines. In all cases, gross revenues are up, making for a gain of 6 1/2% for Northwest to 44 1/2% for American. The leverage effect on earnings is highly pronounced in all cases, excepting Midcontinent which shows a slight decline in net income.

The accompanying table reveals the comparative gross revenues and net income for the first six months of 1951 and 1950 for the Big Four and other trunklines. In all cases, gross revenues are up, making for a gain of 6 1/2% for Northwest to 44 1/2% for American. The leverage effect on earnings is highly pronounced in all cases, excepting Midcontinent which shows a slight decline in net income.

While the industry trend in both revenues and net income is definitely on the upslide, major qualifications are present in all cases and temper the quality of the earnings which have been reported.

Mail Rate Effect—For example, during the first half of the year, the Big Four and nine additional carriers reported a net profit on mail. Instead of making a non-revenue application to the previous year affected, an adjustment was made in the current first half, affecting net results. Under the Civil Aeronautics Board decision, a uniform 45-cent-a-ton rate was made to supply for all of the Big Four for past periods up to Dec. 31, 1950, extending back into early 1947. Further, a flat 45-cent-a-ton rate was declared effective from Jan. 1, 1951.

On this basis, total company losses aggregating \$4,970,000 are allocated for the group (\$610,000 for American, \$579,800, Eastern, \$2,113,000, TWA, and \$1,657,000 for United). But these expenditures will be reduced by tax credits to the carrier resulting from the investment.

For example, while American was reported \$196,000 for 1950 and prior years, its losses for past periods were reduced by only \$149,543. This adjustment for prior years, together with the current net, are taken into 1951 results.

Similarly, United net held by the CAB to have been overpaid \$1,208,000 for 1950 and prior years. The net amount of its refund for this period, after tax adjustments was \$667,416. This is reflected in its 1951 earnings statement.

In other words, the net income of the Big Four would have been even greater for the current six months were it not for these adjustments resulting from the CAB.

On the other hand, a serious quality may be present in the earnings as reported by TWA. Its results include its domestic and international operations. At the latter, the carrier continues to operate on a temporary mail rate which affects results relative with 1949. Re-estimating to be adjusted in a CAB show might make which, if made after this year, would materially reduce earnings for the past two and one-half years.

In a broad sense, the industry's earnings prove to have been only by its capacity. Additional equipment is being put into the airline system as rapidly as it becomes available. The need for commercial aircraft is so great that airlines have turned down offers of new \$60,000 each for their aircraft and high operating cost DC-3s. This is the constraint created by lower traffic conditions.

—Selig Altschul

AIR TRANSPORT

CAA Testing Terminal Baby Omni

Experimental device, cheaper than ILS or VOR/DME, may give all-weather service to local airports.

By F. Lee Moore

A new experimental terminal "baby" omnirange may be the practical answer to the problem of getting reasonably dependable all-weather service to local airports.

Air Transport Association and Civil Aeronautics Administration technicians say that so far this so-called TVOR is the only device they know that is reliable for both navigation and landing approach at about one-third the cost of ILS or VOR/DME, and as a key feature of radar's cost.

► **The Comparison**—The terminal omnirange (TVOR) is much like the standard omni range instrument. But the TVOR is low-power (50 watts output instead of 200) and has no standby transmitter. CAA is now evaluating two TVORs, one at Washington and one at Oklahoma City. They have been going about three months. CAA reports the "baby" must be in service every experiment they had.

CAA has tentative plans to put 75 TVORs into local airports the next few years if money is available, and evaluation cannot the TVOR meets requirements. Current CAA plans are to install 14 TVORs this fiscal year, at about \$14,600 each.

But a minimum of 300 TVORs is

needed at local airports to keep a reasonably reliable airport schedule through the winter months, experts say. So the airlines are casting about for ways to get out more TVORs into local airports. A cheaper design, plus a partial airport municipality financing may be the answer.

Although CAA estimated cost is \$14,000 for the TVOR, airport may \$14,000 for the "B1" facility housing beacon, both are probably available for less money if requirements are simplified. Military surplus "HF" facilities have been provided by airlines for around \$2,000 and it is hoped the cost of an omni can be brought down considerably in time.

► **Cost Comparison**—CAA estimated cost for initial procurement and installation, and for annual maintenance cost, are as follows:

► **Terminal omnirange** Initial cost is \$14,000; maintenance \$5,000
► **"HF" facility housing beacon** Initial cost is \$14,000; maintenance cost \$5,000

► **ILS omni and DME** Together, but without studio equipment for the omnirange. Initial cost is \$50,000 for the LVOR, and \$22,000 for the DME; maintenance cost is \$6,500 for the LVOR and \$22,400 for DME

► **Standard omni range and DME.**

Initial cost is \$103,000 for VOR and \$22,000 for DME; maintenance cost is \$7,500 for VOR and accounts to \$14,000 for DME.

► **Instrument Landing System** Initial cost complete with studio and two markers is \$121,000; maintenance cost is \$10,500.

► **L/NP 4-course range** No initial cost estimate is available or projected because this obsolete equipment is to be decommissioned on omnirange and DME go on; maintenance cost ranges from \$5,000 to \$7,500.

► **TVOR Advantages**—Here are relative advantages of the TVOR over other low-cost devices.

► **The TVOR localizes as the standard omni channel for which all airlines will have reserves by the end of this year.** So there is no new airborne equipment needed to use it.

► **It will allow weather minimums of 500-ft ceiling and one-mile visibility, experts say, and experience may reduce these.**

► **The omni gives essentially precise and accurate information for both navigation and landing approach.**

► **The TVOR can make all airports equally usable in atmospheric weather as it is not a misdirected beam. Its installation locally would fill holes in the standard omni-range VOR/DME reception system and do so in the same system.**

► **Other Conditions**—Contrasted with these qualifications, the other candidates for low-cost landing and approach are as follows: The "HF" facility provides no course line navigation information, and, being low-frequency, it is not an all-weather instrument as it is old and static-free.

Another idea being considered is for an ILS installation without markers or a receiver. That also would provide no course line information and at the same time would restrict the pilot to one runway only.

Finally, the existing standard L/NP-standard reception facility for over 25 years will be decommissioned at almost all locations; it is subject to static, and navigation information is devoid by modern standards.

► **Immediate Outlook**—But until CAA can install more than a handful of TVORs, baby omni, and until the airlines find a way to add more than one CAA presently plans, most local airports schedule reliability and all-weather safety levels may remain about where they are now.

Meanwhile, CAA plans several more months evaluation of operations and maintenance at the experimental TVOR installations at Washington and Oklahoma City.



WIDE-INTENT representation linked by teletype groups creates like forwarding service.



EMERY PICKUP TRUCK brings load directly to freight plane for fast delivery.

► **How Fast?**—How fast can a forwarder be? Emery says it has beaten its own special delivery cost to coast.

This kind of speed precedes Emery from having made it to the freight forwarding as taught in take advantage of both omnirange, a practice by which most other forwarders survive. Instead it charges a premium for its speedy, working service and has found that an increasing number of active customers are eager to pay it and move back to work. In fact, the more expensive Emery's services, "blue ribbon," is the one showing the greatest steady increase, now up about 50% of the forwarder's business.

Actually the customer can pack either of two basic services:

► **"Blue Ribbon"** is more costly but guarantees delivery deadlines in terms of hours, operates around-the-clock, 365 days a year. The great majority of blue ribbon people cannot be considered, go directly to the airport, and at the terminal go directly to the warehouse.

► **"Expedited"** freight pickups and deliveries are limited to between 8 a.m. and 6 p.m. Most of the expedited loads go to Emery freight terminals, where as much as possible is consolidated and out morning a schedule. In New York, for example, about 90% of the expedited shipments go to the company's East 58 St. terminal. Emery's principal offices are at 161 Second Ave., N. Y. C.

"Shipping is reverse" is a company truly new service filling under blue ribbon standards for the most part, and, as the more complex is a request for a service, Emery is a company through Emery is a company. Rapidly increasing, this service now averages about 30,000 of the forwarder's total shipments.

Emery uses a big maximum of ground equipment, mostly light-weight, but relies on regular trucking services for handling this portion of the transportation.

► **Is-By-By Questions**—The third thing goes concerns an automatic operation. The dispatchers arrive at the airport with an already prepared, so that the surface has only to note and sign them. As soon as the flight leaves the ground, the warehouse Emery office telephones its office at the next day, advising its agent (the of the shipment, giving the airline, flight number, and any necessary instructions for transshipment, if one is necessary). When the next leg of the flight begins, that agent telephones again, continuing the relay. Following delivery, the office at the destination telephones the originating office of the first shipment.

► **The Schedule Factor**—Key factor is the schedule, cargo is transferred from truck to carrier, air to surface and vice versa, so often as necessary, by each Emery office or agent, and at other



ALL-WEATHER GANGPLANK

This model gangplank is one of the latest experiments to protect the surface personnel from rain, ice, snow, fog and other adverse ground equipment while loading the plane. Designed by Airways Engineering Corp., Washington, D. C., the gangplank can be added to any existing airport. It in-

cludes a built-in elevator, telescoping walkway which can be raised through 110 deg. and moved from ground level to loading dock height of any existing runway plane. The manufacturer says that increased loading efficiency will reduce time plane spends at a loading position 50 percent.

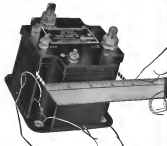
Emery Sets Fast Forwarding Pace

Because of on-the-spot followups of shipments in transit, Emery's customers can revise production deadlines.

By Erwin J. Balaban

U. S. domestic airfreight will collect nearly \$2 billion this year from their biggest single air freight customer—expressly expediting Emery Air Freight Corp. The New York air freight leader in total will pocket over \$2 million from its most operation and will be a peak in the neighborhood of ten percent in the present.

The reason Emery's freight forwarding service has turned out so profitably—the company has grown since 1946 and its turnover last year alone doubled last year's—may be that it has set up what are finally equivalent to a personal courier service, door-to-door, and operates the maximum speed potential from the entire U. S. transportation set up for express shipment of freight.



Measure of Acceptance

Superior performance within the same size and weight boundaries is just one of the reasons why Hartman A-706A[®] Reverse Current Cutoffs have made obsolete the best voltage types formerly used . . . why today they control more military and transport aircraft generators than do all other make combined.

Designed to close on differential voltage between generator and bus rather than at a fixed voltage, the A-706A cutoff is free from all contact flutter. Troublesome rectifiers and current-drawing ballast tubes have been eliminated. The A-706A cutoff operates with any dc generator up to 500 amp capacity having a normal regulated voltage of 28.5 volts. 600-amp⁺ units also available.

*Manufactured to JN3025 (Spec. MIL-C-5036). Literature on request.

the Hartman Electrical Mfg. co.

MANSFIELD, OHIO



TWA Plans More Air Coach Service

Trans World Airlines plans to start two more air coach services soon—both to San Francisco.

One will be TWA's third transcontinental air coach, rounding duty from New York, the other is an extension of the Kansas City-Los Angeles daily coach on up the coast to San Francisco.

TWA already operates two 81-passenger Constellation coaches a day, both to Los Angeles. The new San Francisco coach will be a 60-passenger DC-4. Carrier's daily overnight coach services now operating are two New York-Los Angeles Constels, a New York-Chicago DC-4 via Pittsburgh, and a Kansas City-Los Angeles DC-4.

TWA is reported planning acquisition of five more Constellations to round out the full Company bus also set in high bid of \$10,000 for a CAA Constellation in almost new condition. Trans World's coach services have added well since its first transcontinental coach flight last year, which actually carried 164 persons—77 adults, 82 babies and five cats.

New Services for Alaska-Northwest

Both Pacific Northern Airlines and Alaska Airlines, co-ordinated by the CAB to provide scheduled service from Portland, Ore., and Seattle to Alaska, hope to start operations about Aug. 15.

Each has a DC-4 undergoing conversion to provide round duty service with more equipment expected later. Pacific Northern bought its plane for a of Mexico, now is having it converted reported \$500,000 from American Giant by General Capital in Los Angeles.

Alaska Airlines has secured the release of one of its DC-4s from MATS, now is doing the necessary conversion in its own Fair Field shop north of Seattle. MATS has two other DC-4s which Alaska Airlines hopes to get back soon.

Pacific Northern will be flying primarily to Anchorage while Alaska Airlines will serve Fairbanks. Alaska Airlines has been flying scheduled routes to 6,000 miles in Alaska for the last 17 years, expects these routes to feed back into the new Fairbanks-Seattle-Portland run.

Both lines will use the Seattle-Tacoma International Airport. Pacific Northern continuing to do its maintenance at nearby Boeing Field, and Alaska Airlines at Puget Field. Pacific Northern would like to get hangar space at Seattle-Tacoma but none is available, and construction, even in conjunction with another line, would be expensive.

Mail Pay Accounts

Domestic airlines are about square with the government on back mail pay accounts, international airlines are owed some back pay, but substantially less than they ask. Civil Aeronautics Board Chairman Harold Nyrop states in a letter to Sen. Edward C. Johnson.

"There will be little or no liability for additional mail compensation in the domestic carrier, including both maillines and local service operators," according to Nyrop's letter to Interstate and Foreign Commerce Committee chairman, Sen. Johnson.

Refunds on overpayments to some airlines will about satisfy the government's Dec. 15, 1956, contingent liability of about \$88.5 million for back mail pay claims by the domestic carriers.

As to international carriers, Nyrop says: "The Board's analysis in the international field are not as far advanced as the analysis completed in the domestic area, but it is the Board's present judgment that the final mail pay awards to the American flag carriers in the international field will be substantially less than the indicated contingent liability."

CAA figures contingent liability based on current claims for back mail pay international, \$77,325,000; domestic, \$425,000.

As an example of how the contingent liability works away, Nyrop points out that the Bag Four airlines—American, Eastern, TWA and United—claimed \$63.9 million in back mail pay for 1947-50. But the airlines ended up owing the government about \$3.5 million instead, estimated by the amount settlement on a permanent mail rate which is figured at 55 cents a ton mile.

SHORTLINES

►AB-American Airways—AAA, advises the press that AAA "will lose a priority accord," and that the recent C-46 accident in Newark was by an unauthorized Miami owner with the same identification, scheduled local service airlines All American. "Someone is neglecting his name before we did, there is little we can do about it legally."

►Austrian National Airways—ANA, reports a 64% increase in passengers carried and 28.5% in air freight the year ending June 30, 1951, compared with a year ago. Passengers increased over 650,000 and freight weighed 72.9 million lb.

►Central Airlines—Central's July pas-

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single traffic increased 21% over June to 1,762 passengers a day.

► **International Air Transport Assn.**—International airline traffic transactions through the IATA Clearing House increased about 15% since a year ago the first half of this year—to \$75,503,890.

► **Los Angeles Airways—LAA's** cargo operations in June had operating expenses of \$1.16 a ton, compared with \$1.48 a year ago. A direct maintenance expense from 5 cents a ton a year ago to 19 cents in June this year, due to a night accident, was offset by reduced depreciation charges.

► **Puerto Rico—San Juan Municipal Airport's** second landing fee may cost American and TWA about \$35,000 more this year than last. Estimated airport service will go from \$15,000 to \$42,000.

► **"Q" Mexicana—New airline** plans to start Mexico City-Guatemala service via Mexico, Tuxtla, soon. Mexicana owns 71% of the stock. Service awaits a concession from the Mexican Secretariat of Communications. Service is under at the present time at TACA, and Pan American.

► **Sabena—Sabena Belgian Airlines** reports passenger increases in the following proportions: up 34% through Brussels the first half; Belgium 44%, Netherlands 15%, U. S. 12%, French 4%, Switzerland 2%, all other subsidiaries 10%.

► **TACA International Airlines, S. A.**—TACA has started a new air service linking five Central American capitals with New Orleans. Daily service to San Jose, Managua, Tegucigalpa, San Salvador, Guatemala. New Orleans Trip is by DC-3 to San Salvador and DC-4 from there on to New Orleans at total price of \$225.

► **Swire-Carrier** has inaugurated the first scheduled trans-Pacific service by the new Douglas DC-6B, with full 75-passenger load.

► **United Air Lines—New schedules** using its DC-6B operations, plus high load factors due to "increased utilization of seats, cabin heaters and vacuum travel" have helped United set a new one-day traffic record of 6,903,000 revenue passenger miles.

► **Windsor Central Airlines—WCA** in July made its first net operating profit—\$108,197—more than 100% DC-3 operations than months before. Mail pay of \$107,231 was only \$4,000 over a year ago.

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Should be strong in both analytical and practical approaches to design problems in the field of propulsion and related systems.

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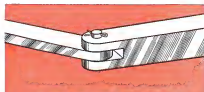
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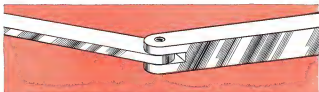
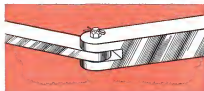
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